





24/50

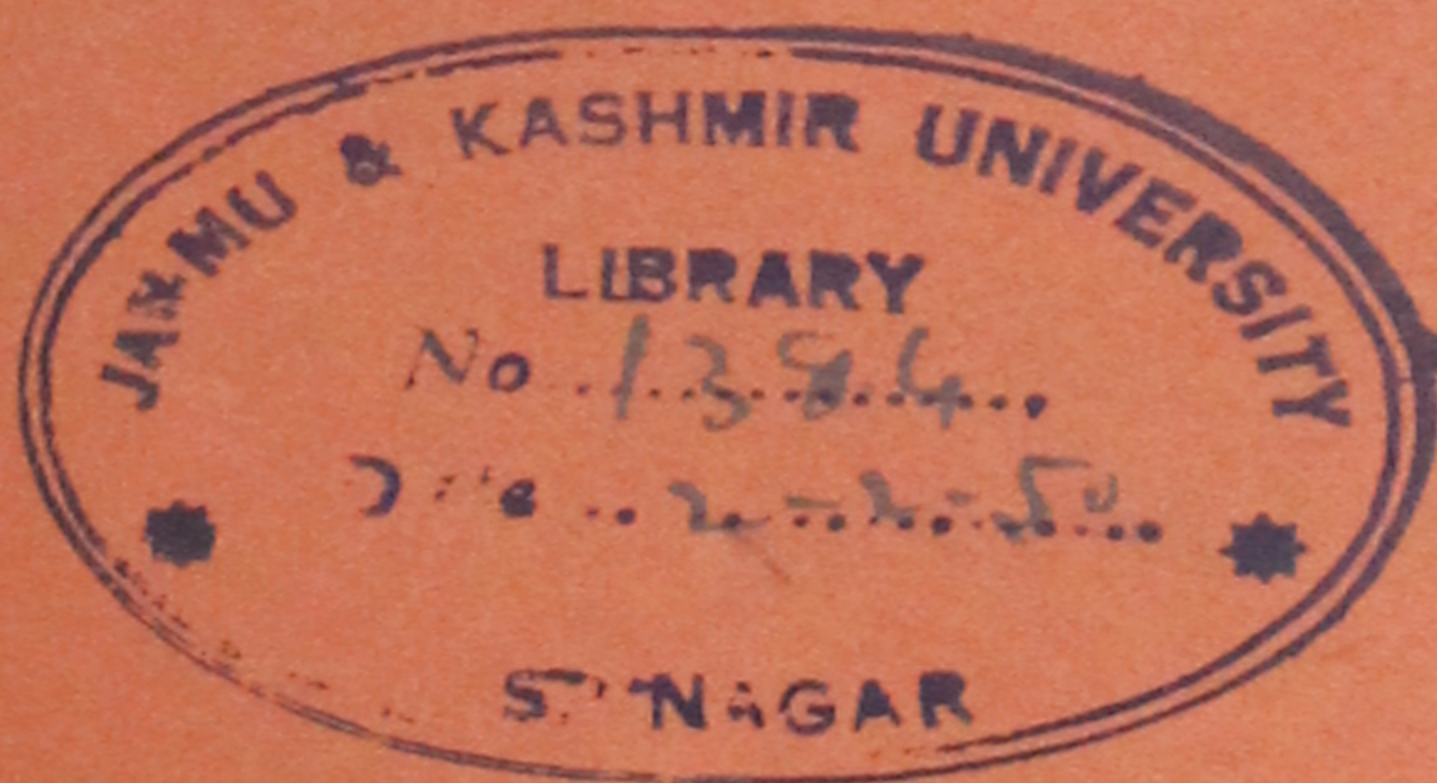
LIST

OF

Subjects in Arts and Sciences in which  
Research was carried out in  
the Universities and  
Research Institutions  
1946-48

*Issued By*

THE INTER-UNIVERSITY BOARD  
OF INDIA



DELHI

December, 1949





# RESEARCH WORK DONE IN DIFFERENT UNIVERSITIES AND INSTITUTIONS

---

## AGRA

### Arts.

#### *English*

1. Patriotism in Modern English Poetry from 1890 to 1940.
2. Aldous Huxley as a novelist of Ideas.
3. The Poetic Genius of Sri Aurobindu.
4. William Somerset Maugham : the study of a popular novelist of the 20th century.
5. John Middleton Murry as a critic with sidelights on Modern criticism.

#### *Sanskrit*

1. The origin and development of the Alankaras in Sanskrit Literature.
2. A Psychological study of the Rasa Theory in Indian Poetics.

#### *Persian*

Persian Language and Literature in India during the reign of Aurangzeb.

#### *Hindi*

1. Mysticism in Modern Hindi Poetry with Special reference to its origin in the Upanishads and its emergence in the Medieval Periods.
2. Keshava Das.
3. Treatment of Nature in Hindi Poetry\*.
4. History of Hindi Journalism.
5. Bhartendu Babu Harish Chandra.
6. English Influence on Modern Hindi Drama and Poetry.
7. Development of Hindi Novels 1867-1942.
8. Guru Gorakhnath and his times.
9. A critical study of the versatile genius of Jai Shankar Prasad.

---

\*Completed in 1948.

10. Studies in Brij Folk Literature.
11. Development of Criticism in Modern Hindi Literature 1868-1943.
12. Critical and formal Survey of Hindi Poetry.
13. The last 25 years of Modern Hindi Poetry.
14. A critical study of the evolution of the Essay in the Hindi Literature.
15. Jayasi, His Art and Philosophy.
16. Gupta Bandhu and his Works.
17. The Evolution and the form of Nationalism in the Modern Hindi Literature.
18. Criticism—its origin and evolution in Hindi Literature.

### *Urdu*

1. Metaphysics of Iqbal.
2. Urdu Poetry in the Rajputana States.
3. Life and Literature under the kings of Oudh.
4. Life and Work of Prem Chand and his effect on Urdu Literature.
5. Influence of English on Urdu Literature.

### *Philosophy*

1. God in the Philosophic Systems of the world.
2. The Philosophy of Vallabhacharya.
3. The finite Individual and the Absolute from the stand point of voluntarism or ethical Idealism.
4. A critical and comparative Study of Indian Aesthetics.
5. A Critical exposition of Lenu's Doctrine of Absolute and Relative Truth.

### *Economics*

1. The Reserve Bank of India.
2. Population trends in India.
3. The Indian Farm Economy.\*
4. Agricultural Credit in India.
5. Co-operative marketing in U.P.
6. State and Indian Industrialism.
7. The War and the Agriculturist in U.P.

8. Industrial Labour in U.P.
9. The War and Indian Currency.
10. Corporation Finance in India with special reference to recent war time developments.
11. Industrial Development of Rajputana.
12. Economic Changes in Tube Well areas.
13. Land Reclamation in U. P.
14. Indian Budgets since Montford Reforms.
15. Economics of Well irrigation.
16. Food Problem in India.
17. Agricultural insecurity in Rajputana and its Economic Effects.
18. Wartime Rationing of Food Grains in U. P.
19. Survey in Indian Agricultural Marketing with Special reference to U. P.
20. Economic Survey of the Alwar State.

#### *History*

1. History of Malwa.
2. History of Bundelkhand, 1772-1856.
3. History of the ceded and conquered later N. W. Provinces from 1803-1853.
4. Influence of Contemporary British Politics in Indian Constitutional History.
5. Mewar and the Moghul Emperors 1526-1707.
6. History of Aryan Expansion.
7. Social Life as depicted in Sutras.
8. The Relations of Mewar and Marathas.
9. Abul Fazal and His times.
10. Mutiny in Central India and Malwa.
11. The Religious leanings of the Sultans of Delhi.
12. Sir George Barlow in India.

#### *Politics*

1. Political Aspects of Gandhism.
2. Political Parties in India.

#### *Geography*

Agriculture and distribution of Principal Crops in relation to population.



**Science***Physics*

1. Investigation of Raman Spectra of Diphenyl Derivatives of Benzene.
2. Spectroscopy.

*Chemistry*

1. The absorption of Mono and Polybasic acids.
2. Studies in Photo Chemical reactions with Special reference to Photo Chemical aftereffect.
3. Isomerisation of Thiocyanetes.
4. A Study of the Alkye derivatives of guanidine.
5. Studies on the behaviour of Complex Cyano-Colloids.\*
6. Further studies on the condensation of the Aldehydes with malonic acid.
7. Investigation of the importance of the trace-element copper in the nutritions of animals in India.\*
8. Studies on the Biochemistry of the Lipids.
9. Studies in Parachor in Solution with Special reference to complex formation and hydrates.
10. Re-action between  $K_2CO_3$   $I_2$
11. Chemical Composition of Essential oils from Indian Plants.
12. Studies on Universal metabolism in 'Indian Dairy Cows'.
13. Studies in the Composition of some complex metallic ferrocynides by Physico-chemical methods.
14. Investigations on the organo-heteropholy acids of Niobium and Tantalum and other salts.
15. Investigations on the importance of trace elements cobalt in the nutrition of animals in India.
16. Studies in Parachor.
17. Condensation of Aldehydes with Fheorene and Fheorene derivatives particularly in the presence of organic bases.

*Botany*

1. Cytology and Genetics of Inter-generic and inter-specific wheat hybrids.
2. Green ear disease of Jowar and Bajra.

3. Diseases of Cucurbits, the Monphology and Pathogenecity of the Fungi associated with the above and their control measures.

### *Zoology*

1. Variations in Arterial System of the Common Indian frog and their significance.
2. Cytological studies on the Cogenesis of Certain reptiles.
3. Studies in Apanteles.
4. Studies in the anatomy of the Indian Scorpion.
5. The Biology of the Coccivellidae of the U. P.
6. Phacentation in Mongoose.
7. Studies in Morphology of Bagrad Picta.

### *Mathematics*

1. Hindu Mathematics.
2. Residuals and distributions in Statistics.
3. Generalisation of Laplaces.\*
4. Hydrodynamics.

## **ALIGARH**

### **Arts**

- |                |     |   |
|----------------|-----|---|
| 1. English     | ... | "Oriental Element in Modern English Poetry."                |
| 2. History     | ... | "Chinghiz Khan"   |
| 3. "           | ... | "Secret History of the Mongols"                             |
| 4. "           | ... | "Sher Shah"   |
| 5. "           | ... | "Edition and Translation of Khafi Khan's Muntakhibulabab"   |
| 6. "           | ... | "History of Khwarizmi Dynasty"                              |
| 7. "           | ... | "Indian History"  |
| 8. "           | ... | "Religious Learnings of the Sultans of Delhi"               |
| 9. Politics    | ... | "The Government in the United Provinces from 1937 to 1947." |
| 10. Philosophy | ... | "Ilmul Kalam of Sir Syed and his Groups."                   |
| 11. "          | ... | "A Critical Study of Psychological Theories of Poetry."     |

---

\*Completed in 1948.

12. „ ... “The place of God, man and Universe in the Philosophic system of Iqbal.”
13. „ ... “Mystical Philosophy of Iqbal.”
14. Arabic ... “Urdu words in Arabic”
15. Urdu ... “Urdu Prose from 1801 to 1857”
16. „ ... “Contribution of Urdu to the Services of Religion and Ethics.”
17. „ ... “Political Consciousness in Urdu Poetry since 1857.”
18. „ ... “Ghalib, his age and Poetry”
19. „ ... “Editing Kulliat-i-Hatim” and notes.
20. „ ... “Shibli and His works”
21. Persian ... “Moghal Princesses and their contribution to Persian Literature”.
22. Education ... “Reorganisation of School Curricula in Mathematics in the Post War reconstruction”.
23. Politics ... “Origin, Growth and Lapse of Paramountcy.”

### *Science*

1. Chemistry ... “Chemical investigation of Satare Farsi- Isolation and Characterisation of its active principles”
2. „ ... “Isolation and Characterisation of Pectins from Indigenous sources such as Frid bail”
3. „ ... “Chemical investigation of Satare Farsi.”
4. „ ... “Isolation and Characterisation of Rare Sugars of Plant origin.’.
5. „ ... “Colouring matter of B. Frondosa.
6. „ ... “Saponins from Indian Plants.”
7. Geography ... “Distribution and Conservation of Forests in U. P.”
8. „ ... “Arab Cartography”
9. „ ... “Arab Geography in 9th and 10th Century A. D.”
10. „ ... “Land utilisation in Rampur State U. P.”
11. „ ... “Industrial Planning in U. P.”
12. „ ... “Land utilisation Survey of Gangetic Plain



(Banaras, Jaunpur, Ghazipur, Ballia and Azamgarh etc.)”

13. „ ... “Land utilisation Survey of Sub-Himalayan East Region.”
14. Mathematics ... “Statistics as applied to Economics.
15. „ ... “Theory of functions as applied to problems of Statistics.”
16. „ ... “Mathematical Analysis.”
17. „ ... “Statistics as applied to Mathematics.”
18. „ ... “Integral Function of Convergence of Series”
19. „ ... “Application of analysis to Mathematical theory of Statistics.
20. Zoology ... “Morphology and Biology of Sugar-cane white fly”
21. „ ... “Biology and Morphology of Mango-Ropper”
22. „ ... “Entomology, Morphology and Ecology of *Lygaeus militaris* Fabr, Family *Lygaeidae*, order Hemiptera-Heteroptera”.

## ALLAHABAD

### Arts.

#### *English*

1. The New Poetic Drama.
2. The place of Nature in 20th Century Poetry with special reference to the years 1900-1920.
3. Lascelles Abarderombic Poet, Critic & Dramatist.
4. Indian writers of English Poetry.
5. W. Somerset Maugham—the Novelist.

#### *Sanskrit*

1. The contribution of ancient Indian Grammarians to the study of Semantics.
2. Buddhist mythology.
3. The influence of Sanskrit upon Ramcharit Manas by Tulsidas.
4. The development of Sanskrit classical Prose.

#### *Arabic*

1. The philosophy of Shah Wali Ullah.

2. Jalauddin Khwarazin Shah.
3. Arab Mathematicians.

*Urdu*

Faizi the Poet.

...

...

*Hindi*

1. Studies in Siddh Literature.
2. Studies in Hindi Bardic Literature from 1600-1800 A. D.
3. Study of Names of Hindu males in the U.P.
4. Comparative study of Gujrati & Brij Bhasha Krishna-Kavya ( 15th to 17th Centuries).
5. The comparative study of the Vaishnava Parts of Hindi and Bengali Literature during the 16th Century.
6. Hindi Lyric Poetry.
7. Nature and Poetry in the Bhakri and Riti periods of Hindi Literature (Thesis submitted).
8. The influence of Bengali Literature on modern Hindi Literature ( 19th to 20th Century).
9. Rambhakri and its expression in Hindi Literature.
10. The conception of women in Medieval Hindi Poetry,

*History*

1. The History of Political Movements in India from 1905 to the Dawn of Independence, August 15, 1947.
2. Nur Jahan.
3. Man Singh.
4. Hindi Revival during the latter half of the 17th century.
5. The administration of India under Lord Mayo.
6. Dalhousie's Policy towards protected Native states in India.
7. The Muslim rule in Kashmir (Thesis submitted).
8. Indo-Afghan Relations 1855-1880.
9. Early experiments in Administration in the ceded and conquered districts ( N. W. Provinces ).
10. Indian Administration of Lord Ripon.
11. Political History of Rajputs ( 10th to 12th Century A. D. )
12. History of Bundelkhand.

*Politics*

1. The Political ideas of Sidgwick.
2. The problem of Liberty in English Political Philosophy from John Stuart Mill to Herbert Spencer.
3. The Administration of North Western Provinces between 1835-1847.
4. The idea of Liberty in English thought after Herbert Spencer.

*Philosophy*

1. The Principle of Individuation in the Vedanta Philosophy.
2. The Indebtedness of the Hindi saints to Vedantic system.
3. Revival of Scepticism in Contemporary British Philosophy.
4. The revival of the Upanishadic thought in contemporary Indian Philosophy.
5. Shankaracharya and Alodenn Abrobrtism.
6. Mysticism in Hindi Poetry.
7. A Critique of the religious thought in India during the last hundred years.
8. Shankar and his modern critics.
9. The Theory of Self as an appearance in Bradley's Philosophy.
10. Dr. Tagore's contribution to Education.
11. The Development of Girls' education in U. P. 1900 to the present times.
12. The problem of mind in contemporary British Philosophy.
13. Problem of immediate experience in Bradley,
14. Ramanuja's conception of the Absolute in the light of modern Absolutism.

*Education*

1. Construction and standardisation of individual Tests for the Ages 9 to 11.
2. Tests of mechanical aptitude for ages between 9 to 13 years.
3. Recent trends in educational Idealogies.
4. New Orientation of the Psychological foundations of education.

*Economics*

1. The Rationalisation of the Iron and Steel Industry or Jute or Sugar Industry or any of the important industry.



2. Family budgets of some lower castes in Farrukhabad District.
3. Theory of Interest.
4. Central Banking.

*Commerce*

1. Railway Finance in India in the 20th Century.
2. Agricultural planning in the U. P.
3. The marketing of chief food grains in the U. P. with special reference to Allahabad Division.
4. Land Values and Rent.
5. Crop and weather Statistics in the U. P.
6. Sugar Industry in India.

**Science**

*Physics*

1. Refractive Indices of Organic (Aromatic) Crystals.
2. Magnetism.
3. X-Rays.
4. Dielectric constants of Crystals.
5. Absorption of Ultrasonic Waves.
6. Short Wave Emission.
7. Thermionics.
8. The chemical effects on X-Ray emission and absorption spectra.
9. Problems of Spectroscopy.
10. Bandspectra in Schumann region.

*Chemistry;*

1. Studies in Colloids.
2. Fixation of Nitrogen and Carbon.
3. The study of temperature effect on reactions in unsterile soil.
4. Transformation of Carbon and Nitrogen compound.
5. Studies in Nitrogen fixation with Cellulastic substances.
6. Study in Alkali soils.
7. Studies in the preparation of yeasts for molasses and Mangan
8. Study on normal soils.
9. Studies in analysis of Vegetables and Fruits.
10. Study in temperature effect in soil reactions in similar conditions.
11. Studies in nitrogen fixation and organic substances in Indian soils.

## II

12. Studies on the properties of Hydrons-Oxides and complex formation.
13. Colloidal and other physical properties of Resin.
14. Physical Chemistry.
15. Organic Chemistry.
16. Molecular Solution Volume and allied Properties.
17. Chemical investigation of Plant Products.
18. The investigation of the reduction of nitric and nitrates under various conditions.
19. Use of Silica Gel in Heterogeneous Catalysis.
20. Studies in Hydrons Oxides.
21. Nitrogen changes.

### *Botany:*

1. Soil studies in relation for plant growth.
2. Plant Physiology.
3. Mycology and cytology.
4. The Cytology of Citrus.
5. Mycology.
6. Hormones in relation to vegetative propagation of horticultural and ornamental plants.
7. Problem in plant Physiology.
8. The cultural and pathological studies of some Duteromy ceteal.
9. The cytogenetical studies on some local fruits.

### *Zoology:*

1. Cytology.
2. Morphological studies in Fishes.
3. Binomics & Cytology of Local Fruit flies (*Dacus* species).
4. Analomy of fishes.
5. Studies in Mammalian Dagenesis.
6. Lehgaments in Fishes.
7. Studies in Cytology.
8. Nervous system of siluroid fishes.
9. Cntomology.
10. Morphology and Life History studies of Trematodes (Digenetic).
11. Fish.
12. Histology and Morphology of the brain of Silveroid fishes.

13. Morphology and Life History studies of certain digenetic trematodes.

*Mathematics:*

1. Fluid Dynamics.
2. Astro Physics.
3. Fluid Dynamics and Dynamics of the Galaxy.
4. Functions of real variable and the Theory of Fourier Series.
5. The Theory of function and the summability of Series.
6. Astro Physics.
7. Theory of Functions of a real variable and Fourier Series.
8. Theory of functions of a real variable.
9. Theory of functions of Real Variable and summability of Series.

## ANDHRA

1946-47

### I *Mathematics*

- (a) On the Addition of Complete primitive residue sets.
- (b) On the probability that two  $K$ th power free integers belonging to an assigned Arithmetic Progression should be prime to one another.
- (c) On the Asymptotic distribution of a class of primes.

### II. *Economics and Sociology*

- (a) "The Problem of the Rupee" Two articles. The Future of International Trade.
- (b) 'Cheap money Policy'
- (c) "Prof. Shenoy's method of estimating India's foreign indebtedness in 1945.
- (d) Social Legislation in India.
- (e) Strike wave in India.
- (f) Land Systems in India : with special reference to Permanent Settlement.
- (g) The First or American Convention at work Parts I & II.
- (h) Division of Powers in Indian Constitution.
- (i) Hindu Womens' Rights to Property.



### III. *History and Politics*

Dissensions during Tuluva Narasa's Regency.

### IV. *Philosophy*

- (a) Contribution of Buddhism to Indian life and thought.
- (b) Chapter on Philosophy in XXth. Century India.
- (c) "The development of Children's personality through the basic craft education."
- (d) "An Exeprimental study of errors in reasoning"

### V. *English.*

- (a) Germanic Ab and its derivatives.
- (b) A study of T. S. Elit as the Modern Arnold.
- (c) The Future of English in India.
- (d) Dramatic Irony.

### VI. *Commerce.*

- (a) Reserve Bank and the Management of Public debt : Part II. Sterling Debt.
- (b) The Land Systems of the Madras Presidency with special reference to Inam tenures.
- (c) Taxation of Agricultural incomes.
- (d) Reform of Railway Rates structures.
- (e) Railways aud Industrial location.
- (f) Road Transport Policy in Madras.
- (g) Transport conditions in Andhra Desa
- (h) Review of the Railway Budget.
- (i) Railways and Industrial Location Part II.
- (j) Note on Stabilisation of Agricultural prices.
- (k) The Consumers' Movement in Ceylon.
- (l) Tenancy systems and Improvement of Agriculture.
- (m) Textile policv of the Madras Government.
- (n) Future of Retailing Co-operation.
- (o) Producers'—cum—consumers' co-operatives societies.

### VII. *Other Papers*

- (a) The Universal Feeling in the Literature (Hindi).

- (b) Civilisation in chaos.
- (c) Pakistan. (Telugu).
- (d) Hindi, Urdu & Hindustani.
- (e) The Culture of the Hindus.
- (f) Story writer Premchand.

### **J. V D. College of Science and technology**

#### **1 Physics**

1. Diffraction of Light by Ultrasonic waves of very high frequencies.
2. Diffraction of Light by High Frequency Ultrasonic waves.
3. Ultra-violet Bands of Cadmium Iodide.
4. Bands of the Mercury Iodide Molecule (Preliminary notice)
5. The carbon Isotope in Raman Scattering.
6. Raman effect in Benzene, the isotope effect.
7. Temperature dependence of Intensities of Raman Lines.
8. Applicability of the Plaezek's theory of Raman Scattering at High temperatures.
9. Molecular structure of  $\text{CH}_3\text{CN}$
10. Intensity and polarisation of Rayleigh scattering in crystals.
11. Very high frequency sound velocities in Acetone water mixtures.
12. Diffraction of light by High ultrasonic waves.
13. Hiedemann patterns at very high frequencies.
14. Ultrasonic velocities at high frequencies
15. Asymmetry of shape and periods of oscillation in Electric Fields.
16. Dielectric constants of crystals I: different varieties of quartz.
17. Combination and overtone lines in the Raman Spectrum of chloroform.

#### **II. Applied Physics**

1. Emission Bands of the PO molecule.
2. Ultraviolet Bands of Mercury iodide.

#### **III. Chemistry**

1. Chemical Examination of Plant Insecticides. Part I Chemical components of Derris feruginea.
2. Colouring matter of the flowers of Hibiscus vitifolius.
3. Chemical Examination of Plant insecticides part II.
4. Constitution of Gessypin Part I.



5. Constitution of Populnin.
6. Chemical examination of plant insecticides part III. Chemical components of Derries Robusta.
7. Insecticidal properties and chemical constitution part I some simple flavone derivatives.
8. Pajaneelin, a bitter component of pajaneelin Rheedii.
9. Constitution of Oroxylin-A.
10. Synthesis of Rhamanzin.
11. Insecticidal properties and chemical combination Part II. simple coumarines.
12. Do. Do. Part III. Partial methyl ethers of flavones
13. Constitution of Gossipin part II.
14. Nuclear oxidation Part I.
15. Nuclear oxidation part II.
16. Uranium mineral from Nellore District.
17. Determination of magnesium and residual manganese in rocks and minerals with 8-Oxy quinoline.
18. Melting point curves of boric acid and O-hydroxy carbonyl compounds.
19. Luminescence in the solid state in boric acid as base Part III Azaodyes as activators.
20. Somarkite from Nellore Dist. part I.
21. A note on the nuclear methylation of laconic acid.
22. Colouring matter of Tambul seeds - Tambuletin- Part I.
23. Synthesis of Monomethyl ethers of Kæmpferd.
24. Nuclear oxidation in the Flavone series P. I to IV.

#### IV. *Technology*

1. "Ammonolysis of solid seed fats under pressure."
2. "Concentration of graphites by frothflotation.
3. Ammonolysis by liquor ammonia under pressure.
4. Reactions of CO<sub>2</sub> under pressure in aq. medium.
5. do do in non-aqueous medium.
6. Ammonolysis of solid seed fats by liquid Ammonia under pressure.
7. Chemical components of the flowers of Morniga-Pterygosperma.

#### I. *Geology*

1. Minerals in world politics.

2. Place of Geology in the Economic development of the country.
3. Bog formation in Nizamsagar area.
4. Memoir on Bhima series and Geology of Gulberga district.
5. Limestone quarries Gulberga Dist.
6. Bog formation in Nizamsagar canal area.
7. A note on the upper Vindhyan Sandstones in Banda Dist.
8. Studies in charnockite from St. Thomas Mt. Madras, Part II.
9. Anisotropy in the elastic behaviour of rocks.

## II. *Botany*

1. A case of Polyembryony in *Poivreia coccinea*
2. A contribution to the embryology of *Pisonia aculeata*.
3. Some observations on the morphology of two *Temelastomaceae*

## III. *Law*

1. Legal Profession in Ancient India.
2. An inquiry into the date and source of the *Manu Smriti*.
3. Apostasy and its effect on prior Hindu Marriage.
4. Hindu Marriages and Jurisdiction of Foreign Courts to entertain Nullity proceedings.

## AFFILIATED COLLEGES

### I. *Agricultural College, Bapatla :*

1. Chemistry : (a) Analysis of well waters in the locality  
(b) Changes in the sugar content of sweet potato during shortage.  
(c) Analysis of Raw and par-Boiled rice.  
(d) Starch preparation from Arrowroot.  
(e) Vegetable Analysis
2. Botany : Anatomy of the paddy plant — *Oryza Sativa*.
3. Cytogenetics : Cytogenetics of paddy — *Oryza Sativa*.
4. Pisciculture : Possibility of fish culture in ponds at Bapatla.
5. Entomology : Studies on the local hosts of the lac insect *Laccifer lacca*.

### II. *Govt. Training College, Rajahmundry :*

“The reduction of the General Equation of the Second Degree to the Standard Form 3.”

### III. *Andhra Medical College, Vizagapatam :—*

1. An enquiry on Cirrhosis in animals and its bearing on the aetiology of Infantile Biliary Cirrhosis.
2. "The Neuraxis of South Indian Foetuss and Neonate."
3. Investigations in :—
  - (i) The active principles of an indigenous plant *Sida Cordifolia* with reference to its Ephidrine content.
  - (ii) Activity of *Strophanthus Kombe* grown in this region.
  - (iii) The comparative merits of Sulphathiazole, Sulpha guanikline, and sulphanilamide in Baciliary dysentery (in collaboration with Dr. P. Kutumbiah).
  - (iv) Modern Advances in Therapeutics.
  - (v) Recent drugs and rends in Drug action.
  - (vi) Study of Therapeutic value of sulphadiarine,

Comparative study of the Histology of the Endocrine Organs of Mammals with special reference to the *Pteropus Edulus*.

### IV. *P. R. College, Cocanada:—*

"Commentary in Sanskrit on Taittireeya Upanishad, Sambandha Bhashya of Sree Sankara Acharya".

### V. *V. R. College, Nellore:—*

- (i) Liberty of the Press—its legal restrictions.
- (ii) The Cabinet Mission's scheme and the division of powers.
- (iii) "Theory and Practice of Public Finance."
- (iv) Research on "Alankara Literature."

### VI. *Mrs. A. V. N. College, Vizagapatam.*

- ( i ) "Galsworthy."
- (ii) Recovery of wax from press cake of sugar factories by flotation.
- (iii) Oils from (a) *Psoralla Corylifolia* (b) *Trigonella fenngraecun*.
- (iv) A survey of the Marine Fish Fauna of Vizagapatam Coast."



(v) A preliminary survey of the Brackish water fishes of Vizagapatam."

1947-48

## I. J. V. D. COLLEGE OF SCIENCE AND TECHNOLOGY.

### 1. *Physics*

1. Photo-elastic effect in crystals: a New result for the class.
2. Third order elastic coefficients of crystals.
3. The dielectric constant of diamond.
4. Diffraction of light by very high frequency ultrasonic wave.
5. Diffraction of Light by high frequency ultrasonic waves : Effect of tilting the wave front.
6. Photo elastic effect in Barium nitrate.
7. Elastic constants of Alum determined by a new ultrasonic method.
8. Photo-elastic behaviour of ammonium alum crystals.
9. Crystal symmetry and Physical Properties : Application of Group theory.
10. Effect of increasing Frequencies on the ultrasonic diffraction patterns.
11. Multiple separations in complex spectra, parts I and II.
12. Band spectrum of carbon disulphide ( triatomic molecule ).
13. Band spectrum of Thallium Iodide (preliminary note).
14. Flutter Phenomena.
15. Coloured limestones of the Palnad Area.
16. Dielectric constants of crystals Part II-Gypsum.
17. Dielectric constants of marbles and limestones.
18. Dielectric Anisotropy of rocks.
19. Diurnal and seasonal ionisation of atmospherics.
20. Ultrasonic studies in Amethyst and Surky quartz.
21. Elastic frequencies of Amethyst and surky quartz.

### 2. *Mathematical Physics*

1. Regions at Infinity in different geometries.
2. Symmetry properties of wave Parts I & II.
3. On absolute convergence of multiple Fourier Series.
4. A uniqueness theorem for Eigenfunction Expansion,

5. Some Results on Double Fourier Series.
6. A Generalisation of Epstein Zetafunctions:
7. Some properties of Eigenfunctions of Laplace-Beltrami operator in Riemannian manifolds.

### 3. *Chemistry:*

1. Nuclear oxidation in the flavone series Part V. A. new synthesis of Wogonid.
2. Nuclear oxidation in the flavone series Part VI. A. new synthesis of calycopteretin and 6 : 8 dihydroxy quercetin.
3. Chemical examination of Jack tree latex and jack fruit gum Part I the origin of Artostenone.
4. Kamala Dye as an Anthelmintic.
5. Nuclear oxidation in the flavone series Part VII oxidation of Baicalein and sentellarein.
6. Colouring matter of Tambul seeds Part II constitution of Tambuletin. Synthesis of o-tetraethyl tambuletin.
7. Synthesis of 5-Hydroxy flavonols.
8. Chemical examination of Jack tree latex and jack fruit gum Part II occurrence of a artostenone.
9. Colouring matter of Tambulcin Seeds. Part III synthesis of 3 : 8 : 4 : Trimethyl ether of Herba Herbacetin and the constitution of Tambulin.
10. Colouring matter of Tambul seeds Part IV synthesis of Tambuletin.
11. Nuclear oxidation of Euxanthone.
12. Constitution of Gossypin Part iii Ethylation of Gossypin and conversion into ethyltambuletin.
13. Colouring matter of Tambul seeds Part V synthesis of 7 : 8 : 4 O-trimethyl herbacetin considered to be identical with tambulin.
14. Some analogues of Pthalein dyes from succinic and maleic acids.
15. Insecticidal properties and chemical constitution Part IV some simple chromones and Isoflavones.
16. Nuclear oxidation in the flavone series Part VIII 7 : 8 Dihydroxy flavone and flavonol.
17. Nuclear oxidation in the flavone series Part IX oxidation of related chalcones.



18. Nuclear oxidation in the flavone series Part X constitution of Gardenin.
19. Constitution of Hibbiscitrin part I.
20. Chemical examination of plant insecticides part V a comparative study of scandenin, Lonchocarpic acid and Robustic acid.
21. Insecticidal properties and chemical constitution part V flavones and chalkones.
22. Constitution of Hibbiscitrin part II.
23. Nuclear oxidation in the flavone series part XI a new synthesis of Nobiletin.
24. A new effect of Hydrogen-bond formation. Chelation and stability of flavonones.
25. A note on the formation of quinones by oxidative dimethylation and the effect of methylating agents on them.
26. A note on the constitution of gossypitrin.
27. Synthesis and study of 5:6:8 Hydroxy flavonols.
28. Nuclear oxidation in flavones and related compounds Part XII constitution and synthesis of Pedicin and its allies.
29. Chemical examination of jack tree latex and jackfruit gum Part III. Ultra-violet absorption spectra of Artostenone and a-Artostenone.
30. Colouring matter of Hibiscus esculantus.
31. Role of flavones in plant drugs.
32. L. Epicatechin from Acavi Catechin.
33. Somarskite from Nellore district Part II-Chemical Composition
34. Lanthanum Nitrate Test for acetate in qualitative analysis Part II-Limits of identification.
35. Gravimetric determination of manganese with 8 - oxyquinoline.
36. Preparation of Ethoxy acetonitrile.

#### 4. Technology

1. Chemical examination of the seeds of derris scandens:
2. Stearic acid from Indian vegetable fats Part I.
3. Graphite analysis.
4. Concentration of graphites for Eastern Ghats.
5. Recovery of wax from sugar factory press cake.
6. Reactions of high pressure carbon dioxide-I.
7. Relation between composition of the oil and stature of the plant.

8. Note on the recovery of oil from seed cake.
9. Chemical examination of plant insecticides part IV Derris Curifolia.
10. Quality of commercial Kamala and its treatment.
11. A new effect of hydrogen bond formation (Chelation) part II Isomerization of Rottlevone analogous to Rottlevin-Iso allovo-ttlevin ( asorottlevin ) change.
12. Chemical examination of the flowers of Melia azadirachta.
13. A note on the Indian Pharmacopeal list.

## II. Erskine College of Natural Sciences.

### *Geology*

1. Bhima Series and other rocks.
2. Limestone quarries in Gulberga district.
3. Age of Saline series.
4. Mineral resources in Andhra Province in relation to industrial development.
5. Optically positive hypersthene from the Charnockites of Guntur District.
6. A note on the occurrence of free sulphur in Druses and cavities of Gosavid, Kistna district.
7. Monazite in the beach sands of Vizagapatam district.
8. Optically positive cordierite from the Khondalites of Pachipenta, Vizagapatam.
9. Origin of Waltair Highlands.
10. Studies in Charnokite from St. Thomas Mount, Madras part II.
11. Elastic constants of Magnetite, Pyrite and Chromite.
12. Petrology and Petro-Chemistry of outliers of Deccan Traps of the Godavari traps.

### *Botany Department:*

1. Development of the embryo of Thymelaea aevensis.
2. A case of polyembryony in poivre cochine.
3. A contribution to the embryology of Pisonia Aculeate.

## III College of Arts and Commerce.

### *Philosophy:*

1. Nyayadarsana.

2. Sankhyadarsana.
3. The Western & the Indian Philosophical traditions.

*Economics and Sociology:*

1. Social protection for agricultural labourers.
2. New outlook in public service personnel.
3. Social security for agricultural labourers.
4. Foundations of Freedom.
5. Terms of Trade and Commercial policy.

*History and Politics:*

1. Pre-satavahana and Satavahana history.
2. Errors in the study of Mediaeval Indian History.
3. The Andhra Satavahana problem.

*English:*

1. Gerard Manley Hopkins : The man & the poet.
2. Indian Writers in Council : 'Proceedings of the First All-India Writers.'
3. Moral values in Literature.
4. Literary Criticism.
5. Indian Writing in English since 1945.
6. Dravidian Literature.
7. The verbal derivations of Germanic ax.
8. The Semantics of Germanic ax.
9. Are the aspirated voiced stops.
10. Why compulsory Philology?

*Telugu:*

1. Prepared 16 Parwams of Dwipada Bharatam.
2. Edited 10 Yakshaganas.

*Commerce:*

1. Taxation of Agricultural Incomes.
2. Cheap Money Policy.
3. Tax structure and taxation of Agricultural incomes.
4. Railways and industrial location.
5. Trend of passenger traffic on Indian Railways (1928-39).



6. The Present Rail Rate Problem.
7. The Seasonal factor in Road Transport.
8. Fundamentals of Business organisation.
9. Decontrol and co-operation.

*IV University College of Law, Masulipatam,*

1. Is the Manu Smriti a Brahmanical composition?
2. Dissolubility of Hindu Marriages through conversion to Islam.
3. The son in Gremie Matrix in Hindu Law.
4. Hindu female life estate holders and Limitation for Declaratory suits in respect of alienations by them.

## ANNAMALAI

### Arts

#### *Economics :*

Development of Local Finance in the Madras Presidency,

#### *History and Politics :*

1. Later Pandyas,
2. Sangam Polity,

### Science

#### *Zoology :*

1. Comparative Embryology of the Melaniidae
2. Development of the Unionidae,
3. Anatomy of Lamethideus,
4. Abnormalities in the development of viviparus,
5. Embryology of Achatina and Opeas,
6. Organogenesis and experimental embryology of Aplocheilus,
7. A Cytological study of the brood povel of Melanoides tuberculatus,
8. An experimental study of the development of Rhacophorus Maculatus,
9. Ecological survey of the Vellar Estuary.

#### *Mathematics ;*

1. Infinite series, Analytic Functions, Topology and Linear spaces
2. Geometry: Chain theorems

3. Applied Mathematics: Screw Theory Rigid Dynamics
4. Pedal and contact circle systems, Cubic transformations associated with Hart tetrads of circles,
5. Solar Physics; Statistics,

*Chemistry:*

1. Mercuration of Vpyrone derivatives
2. Work on the preparation of Ammonium sulphate from Gypsum,
3. Extraction of oil from Vettiver
4. Study of drying properties of the oil francretar spassifloras making, Eupherbiaecae.
5. Work on the mercuration of compounds in the aromatic series and also on the cyclisation of aromatic substances for the production of Iso quinoline and quinoline derivatives. Study of the extraction of the Alkoloid from Vinca-Rosea

## BANARAS

### Arts

#### *Hindi*

1. Evolution of Hindi Poetic forms.
2. Evolution of style as a vehicle of Hindi Prose literature.
3. Historical and comparative study of Hindi syntax.
4. Evolution of lyric poetry in Hindi.
5. Study of Hindi idioms.
6. Historical and comparative study of Hindi Post-positivism.
7. Vaishnava poets of Deccan.

#### *Ancient Ind. Hist. & Culture.*

1. Society and Polity during 600 to 1200 A.D.
2. History of Madhyadesa from 200 B.C. to 200 A.D.
3. History of Hindu Marriage.

#### *English*

1. Walt Whitman and the impress of Indian thought on his works.
2. W.B. Yeats and modern poetic drama.

*Economics & Commerce.*

1. Capitalism and Maximum Economy\*.
2. Money and Employment in India\*.
3. A study of Indian Prices — 1918—1939 (For Ph.D.).
4. Industrial Peace in India (For D.Litt.)
5. Prosperity of the United Provinces (For D.Litt.)
6. River Transport in the United Provinces (For Ph.D.)
7. Rebuilding India.\*

*Philosophy*

1. Yogacharya Idealism.
2. Shankara and Aurobindo.
3. Religious philosophy of Bergson.
4. Relativity of knowledge.
5. Psychological approach to symbolism.

*History*

1. History of the Gurjar Partiharas.
2. History of the Independent Kingdom of Mysore.
3. History of the Chalukyas of Anahiwad.
4. Parties and Politics of India from 1885 to 1931.
5. Development of the Indian fiscal policy during the 19th century.
6. Judicial Administration in Ancient India.

**Science***Botany*

1. Role of Blue-green Algae in the conservation of Nitrogen, organic matter, moisture, etc. in U. P. Soils.
2. Recuperation of Nitrogen in Rice-fields of India through Blue-green Algae.
3. Role of Soil-surface Algae in the Prevention and Control of Soil-surface erosion.
4. Utility of Bloom-Algae as manure and starter for the manufacture of Compost.
5. Physiological bases for Drought Resistance in Terrestrial and Subaerial Blue-green Algae.

---

\*Not for any degree.



6. Physiology and Biochemistry of Blue-green Algae.
7. Algae in relation to sweating of Buildings and their control.
8. Algae of Torrential Streams and their role as food for fishes.
9. Artificial manuring of nursery ponds for fish-culture.
10. Reclamation of 'Usar' Lands in U. P. through Blue-green Algae.
11. Phytoplankton Studies of some local 'Jhils' and ponds in relation to Pisciculture.
12. The algae of the radioactive waters of hot-springs at Rajgir (Bihar).
13. The Subaerial Algae of Nalanda (Bihar).
14. An ecological study of the Volvocales of Northern India.
15. Sessile Algae Communities of the rivers Ganges and Baruna in relation to Pisciculture.
16. Subaerial Algae of Kaimur Formations of U. P. and Bihar.
17. Autecological and Cytological studies of the Life-Histories of some Blue-green and Green Algae.
18. Studies on the Marine Diatoms of the North-west coast of India.
19. Some unrecorded marine algae from India.
20. On the Genus *Batrachospermum* from India, Pakistan and Ceylon.
21. Anatomical studies on *Cystophyllum muricatum* J. Ag.
22. On the cystocarp-formation in some members of the Indian Rhodophyceae.
23. An ecological and morphological study of the Indian Marine algal-flora from the coasts of Bombay and Saurashtra.
24. An Ecological and morphological study of the Ectocarpales from the Saurashtra Coast.
25. The Cytology & Life-histories of Indian Ectocarpales.
26. Embryological studies of the Indian Sargassaceae.
27. An autecological study of the genus *Botrydium* in India.
28. The Freshwater & Subaerial Algae of 'Tarai' part of India, Bahraich, Pyagpur, Katraniaghat, etc.
29. The algae of the sandstone and limestone formations of Kaimur Ranges, Mirzapur, U. P.
30. The algae of Naini Tal, Ranikhet and Almora.
31. Morphology of the Pollen-grains of Angiosperms.
32. Some observations on *Ipomaea biloba* at Banaras.
33. Tropisms of the aerial roots of Banyan.

*Chemistry*

1. Examination of Begasses as a source of cellulose for synthetic fibres.
2. Halogenation of aromatic nitro-hydrocarbons and ketons.
3. Studies on thiozole compounds.
4. Studies on the essential oil of xanthozylon chetasa.
5. Studies on the solid obtained from Pistaka Integerrima.
6. Fermentation of molasses with a view of getting citric acid from the same.
7. Investigations on the constitution of thiourea and its derivatives.
8. Interaction of nitrous acid on amino-compounds.

*Geology*

1. Study of the different Fossil Groups of the Jurassic Rocks of Cutch.
2. Palaeontology and Stratigraphy of Jhura Dome, Cutch State.

*Pharmaceutics*

1. Chemical, Pharmacognostical & Pharmacological investigations on Indian medicinal plants.
2. Methods of Assay of Pharmacopoeal drugs and standardizations of indigenous drugs for possible inclusion in the future Indian Pharmacopoea.
3. Applied Research in finding suitable methods for preparing organic and inorganic medicaments.

*Metallurgy*

1. Electro-galvanizing of steel.
2. Laboratory experiments on the preparation of Zirconium and Zirconium-aluminium alloy by Aluminothermic Process and modifications thereof.
3. Application of Powder Metallurgy in self lubricating bearings.
4. Metallurgical study of some of the cycle parts.
5. Metallurgical study of some bicycle parts and a plan for establishing a bicycle factory in India.
6. A Metallurgical study of some automobile parts.
7. Laboratory investigations into the Indian occurrences of Columbite and Tantalite.



8. Preparation of Beryllium alloys from Beryl.
9. Beneficiation of poor quality Indian coals by (1) Float and sink, (2) Froth Flotation and (3) Blending and (4) H. T. Electric discharge.
10. Laboratory experiments in preparation of chromium and manganese and some alloys using a modified Thermite Process.
11. Effect of aluminium on cast iron.
12. Electrolytic polishing and etching of metals.
13. Experiments on the manufacture of metallic foils.
14. The possibilities of aluminium industry in C. P.
15. Laboratory studies on the nature of the deposits found in the liquid after the separation of alumina and its utilisation.
16. Aluminium and magnesium alloys in modern Aircraft.
17. Investigation into the optimum conditions for electrolytic polishing and etching.
18. Review of the aluminium industries in India and their prospects.
19. Cottage Metallic Industry of Moradabad (U. P.) and how to improve it.
20. Metallurgical study of some small tools.
21. Electro-formings.
22. Prospects of an Electro-metallurgical industry for lead and zinc in India.
23. Chrome plating on Brass & Steel.
24. Laboratory experiments on the isolation of ceria from Monazite sands of Travancore.
25. Ventilation in Modern Mines.
26. Study of a particular mine and suggestions on its development and improvement.
27. Coal Washing.
28. Mine Locomotives.
29. Utilisation and conservation of Indian coal.
30. Miners' Diseases.
31. Preparation of coal for market.
32. Problems and schemes of labour welfare for colliery workers in India.
33. Problems of underground coal face transportation in India Mines.
34. Dust problem in coal mines and its treatment.

25. Accidents in Indian Mines.
36. An investigation into the speedy and scientific development of Indian Mineral Resources.
37. Humidity and its effect on production in deep mines.
38. The Open-cast Mining of thick seams.

### *Engineering*

1. Variation of Electronic Density in the Ionosphere with latitude.
2. Periodic or Rhythmic Variation of the Intensity of Short-wave radio signals.

### **College of Technology.**

1. Research work on Oils & Fats.

Estimation of :—

- (a) Unsaponifiable in Vanaspati.
- (b) Isooleic acid also in Vanaspati.
- (c) Rancidity in Oils & Fats.
- (d) Unsaponifiable and chemical constituents of Indian Rosin

A good deal of work has been already done on soaps, and their washing properties and lathering values etc.

2. The Department has done a good deal of work on the manufacture of 'Denaturant for Rectified Spirit from the Distillation of Neem Cake.' Theoretical part of this work is already completed and the paper on this subject has been already published in the Journal of Scientific & Industrial Research. Further work is being done on other cakes which are not used for edible purposes as cattle food. Work started now on 'Karanja Cake' (Cake from the seed of *Pongamia Glabra*). The scheme for this research is financed by the Department of the Scientific and Industrial Research of the Government of India.
3. The Department is already carrying on experiments on a scheme for the manufacture of Carbon Di-sulphide (CS) also financed by the above Department of Govt. of India. The same work is now being further continued also.
4. Experimental work has been done on the manufacture of Artificial Silk on laboratory scale and different types of Cellulose has been tested for its manufacture.



5. The Laboratory has also one unit for the manufacture of Rubber goods. The Government of U. P. has sanctioned a certain amount of money for carrying on experiments on the manufacture of rubber goods and ebonite.

## BOMBAY

### University Department of Chemical Technology

#### *Work published :*

1. Synthetical experiments in the chromone group. Part XXII.  
(*Proc. Ind. Acad. Sci.*, 1947, 26, 279).
2. Ammonium salts of sulphanilamides and sulphonic acids.  
(*Nature*, 1948, 161, 55).
3. Sulphanilamides. Part I. Salts with sulphonic acids.  
(*Proc. Ind. Acad. Sci.*, 1948, 27, 265).
4. Sodium 2:6—dichloroindophenolate.  
(*J. Ind. Chem. Soc.*, 1947, 24, 375).
5. Anthelmintics. Part III. Anthelmintic activity of *Calycopteris floribunda*.  
(*Proc. Ind. Acad. Sci.*, 1948, 27, 121).
6. Carborundum preparation in an experimental high temperature resistance furnace.  
(*J. Sc. Ind. Res.*, 1947, 6B, 123.)
7. Barium chloride from barytes and magnesium chloride.  
(*J. Sc. Ind. Res.*, 1948, 7B, 5).
8. A new method for the processing of cellulosic materials for the improvement in handle, feel, tensile strength, appearance and affinity for dyes.  
(Indian Patent No. 37369).
9. A new method for dyeing of mineral khaki and metallic pigments on cellulosic materials.  
(Indian Patent No. 37446).
10. Steam superheater design in fatty oil deodorizer.  
(*J. Sci. Ind. Res.*, 1948, VII B, 57)
11. Aniline point of fatty oils.  
(*Curr. Sci.*, 1948, 17, 150).
12. Selenium as catalyst in Kjeldahl digestion.  
(*Anal. Chem.*, 1948, 20, 63)



13. Characterisation of tomato pectinesterase.  
(*Archives of Biochemistry*, 1948, 17, 235).
14. Isolation and characterization of tamarind seed (*Tamarind Indica* L) polysaccharide.  
(*J. Biol. Chem.*, 1948, 172, 501)
15. Comparison of gel-setting properties of tamarind seed polyose with fruit pectins.  
(*J. Soc. Chem. Ind.*, 1948, 67, 190)
16. Improvement in or process relating to the production of fungal amylase and its suitability for the food, pharmaceutical and textile industries.

*Indian Patent No. 37843.*

*Papers forwarded for publications :*

1. The constitution of Citrinin.
2. The Fries Reaction. Part II: The rearrangement of the esters of resorcinol and orcinol.
3. The Fries Reaction. Part III. The rearrangement of the esters of pyrogallol, phloroglucinol, hydroxyquinol.
4. Accelerated oxidation of cotton cellulose in presence of reducing substances. Part I.
5. Accelerated oxidation of cotton cellulose in presence of reducing substances. Part II.
6. Dehydration of castor oil.
7. Extraction of quinone from cinchona bark. Part I.
8. Suppository bases. Part I.
9. Determination of carotene in plant materials: a simplified procedure.
10. Influence of pH on the diastatic activity of fungal and malt amylases.
11. Determination of amlose and amylopectin fractions of starch.

*Papers ready for publication :*

1. Salts of basic dyes with surface active sulphonie and sulphuric acids.
2. The constitution of Citrinin. Part II.
3. Aminosalicic acid and its derivatives.

4. Sulphur dyes and sulphurised vat dyes. Part I. Constitution of Hydron Blue R.
5. Sulphur dyes and sulphurised vat dyes. Part II. Constitution of Cibanone Yellow R.
6. Raney nickel reductions. Part I.
7. Anthraquinone series. Part II. Acylamidoanthraquinones.
8. Anthraquinone series. Part III.
9. Anthraquinone series. Part IV. Absorption spectra of aminoanthraquinones and acylamidoanthraquinones.
10. Anthraquinone series. Part V. Benzamidopyrimidathrones
11. Anthraquinone series. Part VI. Chlorinated aminoanthraquinone and indianthrones.
12. Sulphanilamides. Part II. Nuclear substituted derivatives and some azo dyes.
13. A new synthesis of 4-hydroxycoumarins.
14. 6:7-Benzocoumaranone.
15. Azoic dyes. Part IX. The behaviour of D-benzoyl-2-acetyl-1-naphthol towards diazonium salts.
16. Vat dyes from 2-amino- and 2-7-diaminophenanthraquinones.  
The above aminophenanthraquinones have been condensed with various bromophenanthraquinones to obtain the phenanthrimides. They have also been condensed with the chloride of 2-hydroxy-3-naphthoic acid to obtain a dye applicable both as a vat dye and as a "naphthol."
17. Sulphur blacks.  
2:4-Dinitro- L-naphthol and other nitrophenols have been subjected to the action of sodium sulphide for the preparation of sulphur dyes.
18. Acid wool dyes of the quinoline Yellow type.  
Phthalic, dichlorophthalic and tetrachlorophthalic anhydrides have been condensed with quinoline as well as other compounds containing a reactive methyl group. Some experiments have also been carried out with maleic and succinic anhydrides.
19. Basic dyes of the Malachite Green series.  
Michler's ketone has been condensed with the various alkyl ethers of L - and B - naphthols. The resulting dyes have been compared for their fastness properties.



## 20. Azo dyes from dihydroresorcinols.

Dimethyl- and phenyl-dihydroresorcinol have been coupled with various diazonium salts, and the resulting dyes for acetate silk have been studied with regard to their fastness properties.

## 21. Investigation on alkylnaphthalene sulphonic acids.

Wetting agents of the Nekal BX type have been prepared from naphthalene using propyl, isopropyl, and anyl alcohols and cyclohexanols. Alternatively, naphthalene-sulphonic acid has been condensed with alcohols.

## \*22. Utilisation of sodium sulphate.

## 23. Mechanism of oxidation of cellulose in presence of accelerators.

## 24. Some physical properties of sodium hypochlorite solutions.

## 25. Some properties of oxycellulose.

## 26. Reduction potentials of vat dyes.

## 27. Constitution of cellulose and its degradation products.

## 28. Inhibition of the precipitation of the hydroxides of chromium and iron in presence of caustic soda.

## 29. Preparation of cellulose from banana stalk.

## 30. Extraction of quinine from cinchona bark. Part II.

31. Anthelmintic activity of *Kamala*.

## 32. Automatic burette, an improved form.

## 33. Suppository bases. Part II.

## 34. Derivatives of oil and fats.

The monoglycerides of drying, semi-drying and non-drying oils have been prepared, and their uses for the preparation of various types of coating compositions studied.

## 35. Studies in natural resins.

A simple method for preparing varnishes based on shellac, which has become insoluble in solvents, has been developed, and the film proportions of the varnishes determined. The chemical reactions involved in the deterioration of lac and its reconditioning by different methods have been studied in detail.

## 36. A process for the hydrolysis of proteins by treatment with or without carbon dioxide under high pressure and at elevated temperature.

---

\*Subsidised by industry.



- \*37. Evaluation of pectins.
- 38. A process relating to the treatment of tamarind seed and the production therefrom of a degraded polyose which is a gal-forming substance comparable to fruit-pectins and suitable for use in food industries.
- 39. Studies on Indian shark liver oils.
- 40. Biosynthesis of ascorbic acid in plants.
- 41. Synergism among chemotherapeutics : Surface-active agents and sulpha drugs.

*Work in Progress*

\*1. Sulphurised vat dyes.

Reduction by Raney nickel as a means of elucidating the constitution of sulphur dyes has been studied. The structure ascribed to Hydron Blue R, Cibacron Yellow R and Cibacron Orange R by Fierz-David have to be revised in the light of new experimental data that have now been obtained, and new structures have been suggested. An extended study of the action of Raney nickel on dye intermediates and dyes has been undertaken.

\*2. Benzanthrone dyes.

In connection with the study of the constitution of dinitrobenzanthrone, a new synthesis of 9-aminobenzanthrone has been effected. Nitro derivatives of 3:3'-and 4:4'-dibenzanthronyls are being studied.

\*3. Anthraquinone acridones.

The constitution of Indanthrene Turquoise Blue GK and 3GK has been established. The usefulness of 1-amino-2:4-dichloroanthraquinone and 1-amino-4-bromoanthraquinone-2-sulphonic acid as intermediates in the preparation of vat and acid dyes is being studied further.

\*4. The constitution of commercial dyes.

Degradative methods in the anthraquinone vat dye series especially the indanthrones and the carbazoles, are being studied.

---

\*Under the auspices of the Council of Scientific and Industrial Research.

- \*5. Chemical constitution and the substantivity of dyes for cellulose.

The absorption spectra and substantivity of various hydroxy-naphthoic acids and their anilides are being investigated. There is an almost complete lack of information on the affinity of the leuco derivatives of vat dyes for cellulose, and suitable technique for obtaining quantitative data is being devised.

- \*6. Azoic coupling components.

- \*7. Constitution of chlorinated indanthrones.

The orientation of the chlorine atoms in the products of chlorination of indanthrone by various methods was studied, in continuation of earlier work. The colour changes observed on treatment of chlorinated indanthrones with oxidising agents have given additional data as regards the orientation of chlorine atoms in the different chlorinated indanthrones.

- \*8. Carbazole derivatives.

9. Synthetic and natural chromones.

Synthetical experiments on flavones and isoflavones have been continued.

10. Surface-active chemotherapeutics.

11. Synthetical experiments in the chromone group.

The various products obtained by the rearrangement of 2-acetyl-1-naphthyl ethyl carbonate have been studied.

Experiments on the synthesis of Latoflavin are in progress.

12. Morellin, the colouring matter of *Garcinia morella*.

Work on the constitution of Morellin has been undertaken.

13. Surface-activity in relation to bacteriostatic and chemotherapeutic action.

In view of the reported filaricidal value of some cyanine dyes, salts of Astraphloxine FF, a typical cyanine dye, with different types of wetting agents have been prepared in order to modify its properties. Salts from other basic dyes possessing medicinal value have also been prepared. New stibonic acids have been synthesised, and derivatives possessing surface activity have been prepared. A route for the synthesis of P-amino-salicylic acid, an active antitubercular agent, has been worked out, and newer derivatives have been prepared. The physical



properties and biological activity of the new compounds are under investigation.

14. Citrinin.

On the basis of new experimental results, a structure for citrinin as an isochroman derivative has been proposed. Work on the synthesis of citrinin has been undertaken.

15. Friedel-Crafts reaction : The condensation of phthalic anhydride with aromatic hydrocarbons.

16. Oxidation of coumarins.

With a view to converting mono and dihydroxycoumarins to polyhydroxy derivatives, their oxidation by ammonium persulphate, ammonium perborate and hydrogen peroxide is being studied.

17. Vat from aminophenanthraphenazines and triaminophenanthraquinones.

2- and 4-Amino- and 2:7-diaminophenanthraphenazines have been condensed with various bromophenanthraquinones. Similarly, triaminophenanthraquinone is being condensed with various bromophenanthraquinones.

18. Azo dyes from 4-acyl-1-naphthol and 6-acyl-2 naphthols.

Azo dyes using various diazonium salts have been prepared from 4 - acetyl-, 4 - propionyl- and 4 - benzoyl -1 - naphthols. Similar dyes have also been prepared from 6-acetyl, 6-propionyl, and 6-benzoyl-2-naphthols. Their properties are being studied.

19. Phenol from chlorobenzene.

20. Studies with composite pigments.

21. Oxidation of cellulose with nitric oxide and oxygen.

22. Reduction potentials of vat dyes.

23. Some experiments with hydrogen peroxide.

24. Some experiments in kier boiling and bleaching.

25. Relation between viscosity and penetrating power of modified starches.

26. Degradation of vat dyed yarn and fabrics during chemical processing of textiles.

27. Absorption of vat dyes by cellulose.

28. Study of fatty oils.

29. Liquid-liquid extraction of fatty oils and their derivatives.



30. Studies in cashewnut shell oil.
31. Hydrogenation of fatty oils.
32. Study of fish oils.
33. Antibacterial activity of derivatives of -naphthol.  
Antibacterial activity of monoalkyl-naphthols has been studied and has been found to be much higher than naphthol. The activity of dialkyl and other derivatives is now being studied.
34. *Oil of Ocimum basilicum*.  
Oil has been collected from the plants at different periods of the year. The chemical composition and the antibacterial activity of the oil are being studied.
35. Anthelmintic activity and chemical composition.  
Various methods used for comparing the anthelmintic activity of drugs in vitro are being studied to evolve a more reliable technique. Anthelmintic activity of different synthesis is being studied with a view to correlate chemical composition and anthelmintic activity.
36. Chemical study of indigenous drugs.  
Chemical study of the pulp of *cassia fistula* and oil of *Carum Indicum* is in progress.
37. Study in carbazole.
38. Reactions of oils and fats.
39. Studies in composite pigments.
40. Study of fatty oils.
41. Wool analysis.  
A number of wool samples received from the Government farms at Gaya and Banihal were analysed for their fibre attributes and recommendations were forwarded about the best types to be selected for sheep breeding.  
Absorption experiments with dyes having selective action on the cortex and the medullary cells of the fibre have shown the adaptibility of this method for the assessment of medullation in wool.
42. Wool quality of some sheep breeds from Gujrat and Rajputana.  
Among the breeds of sheep known as Bikaneri in Rajputana, the one found in Jaipur, called the shekhavati, gives wool having fine, non-medullated fibres and is capable of being developed,

43. Spectrophotometric and colorimetric investigation on the vitamin contents of some natural products.  
Absorption spectra of various carotenoids isolated chromatographically were studied.
44. Studies in the colloidal properties of some Indian clays.  
The base exchange capacities of seven different clays under different thermal treatments were studied. This was followed by a study of the deflocculation of clay suspensions by alkali of various strengths and the concomitant change in the viscosity of the suspensions.
45. Absorption and light transmission properties of some dyes on thin films.  
The absorption of a number of direct, vat and alizarin dyes, so as to show the complete light transmission characteristics of the dye in the visible and the ultraviolet region of the spectrum, was carried out on thin films of gelatin and cellophane. Dye concentrations required for equal light absorption were then compared.
46. Studies in emulsions.  
Variation in the surface area with time of a few vegetable oils emulsified with alkali soaps of various fatty acids was studied with a view to following their relative statistics. The viscosities of these preparations were also determined to examine the influence of the phase volume ratio, the nature and concentration of the emulsifying agent, the amount of entrapped air, the viscosity of the dispersion medium and the size of the emulsion globules.
47. Mouldy amylases.  
The conditions have been standardised for industrial production of mouldy bran, pure enzyme or disizing material using a culture of *Aspergillus oryzae* reported earlier.
48. Studies in carotene.  
Extraction of carotenoid pigments from dried leafy materials was studied using different solvents. Significant results have been obtained using mixtures of different solvents in definite proportions. The noncarotenoid pigments were effectively removed either by saponification under certain conditions or by using various activated absorbents.



Fractionation of red palm oil: The work reported earlier is in progress.

49. Stability of vitamin C in solution.

The work reported earlier is being continued.

50. Pectic enzymes of moulds.

The production of pectic enzymes in liquid media containing various carbon sources are being studied for three different strains of *Aspergilli* and compared with that of solid media. The influence of various supplements has been observed with regard to relative production of polygalacturonase and pectinesterase. The changes taking place in the culture fluid during the growth of the moulds are quite significant. Work in hand relates to the acclimatization of the organism the effect of repeated subculturing and the properties of these mould enzymes.

51. Causes of low level nitrogen metabolism in Indians.

Further metabolic studies have been made with regard to nitrogen excretion and creatinine in urine and the quality and quantity of dietary proteins.

52. Studies on vitamin C.

The work reported last year has been continued.

53. Production of citric acid from *Aspergillus Niger*.

Two strains of *Aspergillus Niger* have been studied with regard to the fermentative production of citric acid from sugars. The yield can be appreciably increased by supplementing the culture medium with different nutrients. Various cultural factors affecting the yield of citric acid have been studied. The organisms have been acclimatized to increasing concentrations of sugar and citric acid. The suitably defected molasses and Mowhra syrups have been tried to replace other carbon sources for the mould.

54. Studies in Pyrolysis.

Preliminary experiments on the destructive distillation of coconut shell and almond shell have been carried out.

## COLLEGE OF AGRICULTURE, POONA.

### *Agronomy*

1. Tillage and manurial experiments—to see the effect on crops.
2. Rotational Experiments in cereals and legumes.
3. Improvement of Indian Vegetables.
4. Some minor agronomical experiments.

### *Agricultural Chemistry*

1. Rancidity in Ghee.
2. Activated Carbon from rice husk, its preparation and use in gul making.
3. Superphosphate from Bones.
4. Isolation of Protein from Groundnut Cake.
5. Nutrition value of crops obtained from improved seeds.
6. Biochemical and nutritional studies on rice to know its manurial requirements.

### *Botany*

1. Cytomorphological studies in the genera :—  
 (a) Indigofera, (b) Cassia, (c) Bauhinia, (d) Plumeria,  
 (e) Allamanda, (f) Ischaemum.
2. Cytology of autotetraploid 'Mug'.
3. Cytogenetic and other related studies in *Dichanthium annulatum*,  
*D. caricosum*, *D. nodosum* and *Bothriochloa intermedia*.
4. Cytogenetics of *Phaseolus* and *Cajanus*.
5. Studies on the effect of 4 Chloro-2 methyl—phenoxyacetic acid on *Cyperus rotundus*.

### *Agricultural Entomology*

1. Life history, Bionomics and control of jowar stem borer (*Chilo zonellus*).

The work is completed by Mr. D. K. Butani and data is presented and approved as a thesis for M. Sc. degree.

2. Aphidae of Bombay.

The work is completed by Mr. H. L. Kulkarni and data is presented and approved as a thesis for M. Sc. degree.



3. Anar fruit caterpillar.  
Life history, Bionomics and control of Anar fruit caterpillar in B. P. The work is under progress.
4. Hairy caterpillars of Bombay.  
A general account of all the hairy caterpillars of B. P. is being worked out with special reference to Katara hairy caterpillars and the control measures in Gujarath.
5. Insect pests of stored grains and their control.  
Practical remedial measures and preventive measures against store pests in Bombay grain godowns is under progress. Lot of information is collected.
6. Safflower pests and their control.  
Work on life history, Bionomics and control of *Perigia capensis* and Aphids is under progress and a good deal of data is collected on the problem.
7. Efficiency of DDT and gammexane and Hexyclan as insecticides to control field crop pests.  
Preliminary trials and experiments are being arranged and encouraging data has been collected so far in the control of mango hoppers, store pests, Deccan wingless grass hoppers, Rice, grass hoppers and Red ants on citrus tree etc.
8. Scientific research on *Aleurodidae* of India.  
Literature on *Aleurodidae* published so far has been consulted and indexed. A catalogue is under preparation giving the list of workers, their line of work, No. of supp. with host plants and distribution etc. Biology of some of the important species of B. P. and the nature and extent of damage caused by Aleurididae is under study.
9. Fluted scale and its control in B. P.  
Survey of the incidence of attack in different parts of B. P. is completed. Control measures are to be taken up shortly.
10. 'Kane' pest at Kumta.  
Observations on incidence of pest in relation to soil moisture, manure, stage of the crop growth susceptible for the attack, and preliminary control measures by the use of Gammexane dust are completed. Elaborate control measures, and seasonal life history of the pest are under progress.

## 11. Sugarcane pests and their control.

Biological control of sugarcane borer by the utilization of *Trichogramma* parasites is tried and encouraging data is collected. Large scale trials with the parasites, incidence of other important pests of sugarcane in relation to micro and macro climatic factors, varietal susceptibility, alternative food plants and the different pests is being worked out.

## 12. Insect pests of irrigated crops.

Life history and bionomics of sann hairy caterpillars, sweet potato weevil, chikta disease etc. is completed and their control measures are in hand.

### 1. Plant Pathology

#### (a) Systematic mycology.

Five new fungi have already been published. Recently a paper on 5 more new fungi has been submitted.

#### (b) General investigation.

Several new virus diseases such as yellow vein mosaic of bhendi, katta disease of cardamom. *Lagenaria* virus, mosaic of papaya and others have been investigated. Control methods in the case of the first two by clean up campaign and closed season have been undertaken.

Investigation into cotton lint staining fungi has been undertaken.

#### (c) Disease Control.

1. *Fungicides*—Several fungicides are being tried in the control of foot-rot of ginger, Smuts of Jowar and Rala, 'Koleroga' of betelnut and leaf-spot of turmeric.

2. *Resistant varieties*—Intensive work is being carried out on evolving disease resistant varieties of wheat against black stem rust, cotton, tur, gram and *lang* against *Fusarium* wilts, brinjal against leaf-spot (Tikka) and rice against blast disease.

3. *Eradication*—Attempts are also made to control the diseases by eradication and roguing in the case of yellow vein mosaic of bhendi by observing "close season" (April and May) by roguing and destruction of cardamom plants for katta disease, destruction of



diseased trees for koleroga and prohibiting sowing of khariff wheat for rust.

## 2. Bacteriology

1. *Soil bacteriology*—Work on “Azotobacter” in relation to different soils, seasonal varieties of crops and pH has been completed.
2. *Plant bacteriology*—Investigations into leaf-spot of soya bean blight of French beans and leaf spot of mango have been published those on *Ipomoea* creeper and black arm of cotton have been completed. Those on *Desmodium*, cowpea citrus canker, cabbage and fruit rots are being pursued.
1. ‘Preliminary Studies of Important Crops in the Bombay Deccan in the Post-War period’
2. ‘Principles and Practice of Farm Costing with Farm Studies’.
3. ‘Summary of costs and receipts from farming (Crop raising alone at Kanher and Islampur in Malshiras Taluka of Sholapur District’.
4. The following articles based on the research work done in the Charotar tract were published.
  1. Dairying as a subsidiary occupation to Agriculturist in the Charotar tract of Gujarat.
  2. ‘Unemployment of Farm Labour in Charotar of Kaira District in Bombay Province’
  3. ‘A few facts about agricultural land in the Deccan of Bombay Province’.
  4. ‘The position of the Proprietary holders in the Rayatwari Tract of Bombay Province in the last quarter of a Century’
  5. ‘Economics of mixed farming of Charoter in Gujarat.
  6. ‘The family budgets of farmers in the Charotar tract of Kaira District in the Bombay Province’
5. An investigation into the supply and demand for milk into the city of Poona was made during the years 40—43.
6. A preliminary stud of the cost of production of vegetables grown under the military scheme was carried out during the year 1945-46.
7. A similar study of cost of production of careal crops grown on

the Taluka Demonstration Centres in Bombay Province was completed.

*Researches being undertaken during the current year include*

1. The resurvey of village Pimple Soudagar in Haveli Taluka of Poona District. This village was first surveyed by Dr. H. H. Mann and his collaborators in the year 1917.
2. Agricultural wages and systems of payments in different districts of the Bombay Province.
3. Scheme for the Study of Farm family Budgets in the Charotar tract of Gujarat will be taken up in hand during this year.
4. Scheme for Investigation of costs of Production and Profits in vegetable cultivation has been re-submitted to the Government.

#### *Horticulture*

1. Rooting response of deciduous cutting as influenced by the position of the basal cut and the degree of slant in planting.
2. Compatibility of different root-stocks viz. *Mimusops hexandra* and *Bassia longifolia*, with Chiku ( *Achras sapota* ).
3. Response of grape-vines to pruning twice in a year, in April and October, as against pruning in October only, in the climatic conditions obtaining at Poona.

### **BAHAUDDIN COLLEGE JUNAGADH**

1. Abnormalities in certain plants-Ecological study of the vegetation in Junagadh and round about.
2. History of Junagadh, Somanath Temple and Gohils of Kathiawar.
3. A paper on Maharana Pratap (already submitted for publication in the Bombay University Journal)

### **BARODA COLLEGE**

#### **Arts**

1. Contribution of women in Ancient Indian Culture.
2. Dress and ornaments in Ancient India.
3. Educational philosophy of Mahatma Gandhi.
4. How far Smrutis Arthasastras and Dharmasastras are applicable in Modern India.



5. Use of metals for therapeutic use as revealed by Ancient Sanskrit Literature, with comparisons.

*Science*

- “Theoretical investigations of liquid, Hc II” in Physics.  
 “Mosses taxonomy and cytology.”

**BHARATIYA VIDYA BHAWAN, BOMBAY, 7.**

1. Asvins in the Rigveda.
2. Text of inscription of the Vakatakas.
3. Gandhiji—A literary Study.
4. Study of Mahavira and his place amongst the teachers of his time.
5. Critical editions of (a) Paumasiricariu, and (b) Sringara manjari and (c) Tarangavaikaha.
6. Epic heroines of India and Iran.

**DECCAN COLLEGE POST-GRADUATE AND RESEARCH  
INSTITUTE, POONA.**

*Indo-European Philology*

1. Synonymic Dictionary of Indo-Aryan.
2. Dictionary of Inscriptional Sanskrit.
3. The Verbal bases of Middle Indo-Aryan.
4. Material for a Dhatu Patha of Indo-Aryan.
5. A Comparative Etymological Dictionary of the Reduplicative Element in Indo-Aryan.
6. A Comparative Grammar of Middle Indo-Aryan.
7. Critical Edition of Visvanatha's Kosa-Kalpataru.
8. The Historical Evolution of Gender in Indo-Aryan.
9. Lexical Element in Sanskrit.
10. A Study of the Hindu Vratas.
11. Nominal Composition in Middle Indo-Aryan.
12. A Study of Kutchi Dialects.
13. A Dialect Study of Marathi.

*Dravidian Philology*

1. A synonymic and Etymological Dictionary of Dravidian Languages.
2. Desi Element in Dravidian.
3. Historical Grammar of Dravidian Languages.

4. Morphology of Middle Dravidian.
5. Revision of Gandert's Malayalam Grammar.
6. Colloquial Dravidian.
7. Vocabularial Contents between MIA and Dravidian.
8. Studies in popular Etymology.
9. Linguistic Edition of Rudrankannanar's Poems.
10. Dynamic Linguistics of Old Kannada.
11. The Historical Grammar of Middle Telugu.
12. The Historical Grammar of early old Telugu.
13. Accent—A Study in Experimental Phonetics.
14. The Problem of Vowel length in Dravidian.
15. Phonetics and Phonometry.
16. The Historical Grammar of later old Telugu.
17. Physical Properties of Dravidian Vowels and Consonants.

*Sanskrit Literature (especially Vedic)*

1. The Bhrgvarigiras Element in the Mahabharata.
2. The Relation between Mahabharata and Atharva-Veda.
3. The Foundations of the Atharvanic religion dealing with the Atharvanic Mythology.
4. The Religion and Philosophy of Atharva-Veda.
5. The Relation of the Brahmana Literature with the Atharva-Veda.
6. Scema in Vedic Sacrifice.
7. Magic in the Atharva-Veda.
8. Magic in the Brahmana Literature and its relation to Sacrifice.
9. Development of the Science of Dramaturgy.

*Semitic Languages and Literature*

1. A Preliminary Survey of the Arabic Literature produced in Audh.
2. Quranology and Traditions or Hadith.
3. Tasamwuf and Mysticism.
4. Dakhani Folk Songs.

*Proto-Indian and Ancient-Indian History*

1. Investigation into Prehistoric Archaeology in Gujarat.
2. Ancient Geography and Ethnography of Gujarat.
3. Excavations at Kolhapur.
4. Jaina Iconography from Karnataka Monuments.
5. Geographical and Cultural Data from the Mahabharata.



6. Megalithic Monuments in India.
7. Prehistoric and Early Historic Antiquities from the Bellary District.
8. History of Jaina Monarchism (from Literature and Inscriptions).
9. Cultural History of the Tantras. (Buddhist and Hindu).

### *Maratha History*

1. The Theory of the Maratha State.
2. History of Konkan.
3. The Developoment of the Maratha Society from the Yadava Period.
4. Biographical Dictionary of important personages in Maratha History.
5. The Weapons and Mode of the Maratha Land Warfare.
6. Visaji Krishna Biniwale.
7. Maratha Struggles on the Goa Borders.
8. History of the Maratha Constitution.
9. Judicial System of the Marathas.
10. Nana Phadnavis.

### *Sociology*

1. Anthropometric Measurements and Blood Tests of castes.
2. Place-names in Maharashtra.
3. Kinship Terminology and Kinship Usages.
4. Folk Songs of Maharashtra.
5. The Rig-Vedic Brahmins.
6. The Concepts of Sin and Crime in the Mahabharata.
7. The Adolescent Criminal.
8. Poona and Camp-A Cultural Study
9. Kaikadi and Berads (Two Criminal Tribes of Karnataka).
10. Social Organisations of the South West Coast of India.
11. Crime in Mysore State.

### **D. A. V. COLLEGE, SHOLAPUR**

1. History of Medieval Gujarat.
2. Allauddin.
3. Impact of the West on India in the XVII and XIX centuries.

**THE SCHOOL OF ECONOMICS & SOCIOLOGY  
UNIVERSITY OF BOMBAY**

**Economics**

*Agricultural Economics*

1. Rural Economy of Gujarat.
2. Land System of Madras Province.

*Demography*

1. A Study in population : Cochin.

*Economic Surveys*

1. Economic Conditions in Sind, 1592-1843.
2. Wealth of Gujarat.

*Insurance*

1. History and Development of Life Insurance in India.

*Labour*

1. Wages and Conditions of Work of Factory Labour in Karachi.

*Organised Markets*

1. Futures Trading and Futures Markets in Cotton, with special reference to India.

*Public Finance*

1. System of Financial Administration in India.
2. Provincial Finance, 1921-1936.
3. Justice in Taxation in India, with special reference to Gujarat.
4. Taxation of Incomes.

*Trade and Industry*

1. The Technique of Modern Commercial Policy, with special reference to Commercial Treaties.
2. Indian Sugar Industry.
3. Textile Industries of Kashmir.
4. Imperfect Competition in International Trade.

*Transport*

1. Local Passenger Transport in Bombay.



*Agricultural Economics*

1. Economic and Social Survey of a Konkan Village.
2. Rural Reconstruction in the Deccan.
3. Life and Labour in a South Gujarat Village (Surat District).
4. A Historical and Analytical Study of British Land Revenue Policy in Deccan and Gujarat.
5. Sub-division and Fragmentation of Agricultural Holdings in India.
6. Economic Survey of Olpad Taluka (Surat District).
7. Agricultural Economics of Borsad Taluka.
8. Crop Forecasting.

*Banking and Currency*

1. Prices in India.
2. Methods and Machinery of Investments in India.
3. Possibilities of the Development of Banking in India.
4. Fallacy of the Gold Standard.
5. Banks in relation to Industry in India.

*Demography*

1. The Population Problem in India, with special reference to Food Supply.
2. Population Problem of Bombay Presidency.

*Economic Surveys*

1. Economic Conditions in India during the Mussalman Rule.
2. Economic Conditions of Educated Women in Bombay City.
3. Economics of Primary Education in Bombay City.
4. The Mussalmans of Bombay—An Economic Survey.
5. Economic Conditions of Baroda State.
6. The Economic Development of Baroda State.

*Insurance*

1. Investment of Insurance Funds in India with special reference to Industrial Finance.

*Labour*

1. Labour Conditions in India.

2. Economic Conditions of Dock Labourers in Bombay.
3. Trade Unionism in India.
4. Bidi Workers in the City of Bombay.

*National Income*

1. Measurement of the Wealth of India.

*Organised Markets*

1. Marketing and Trade of Raw Cotton in Bombay.
2. Stock Exchange—A Comparative Study.
3. Commodity Exchanges in Bombay.

*Public Finance*

1. Income-tax in India.
2. Taxation of Income in India.
3. Federal Finance in India.
4. Public Debt in India.
5. Indian Military Finance.
6. Finances of the Bombay Municipality.
7. Income-Tax in India.

*Trade and Industry*

1. Economics of State Enterprise, with a Study of its Practical Operations in British India.
2. Textile Industries in India.
3. Railway and Industrial Development of India.
4. The Entrepreneur in Modern Economic Society, with special reference to Indian Conditions.
5. The Foreign Trade of India.
6. Some Non-Textile Industries in India.
7. Indian Customs Tariff with special reference to Trade and Industry, 1913-1929.
8. Indian Customs Tariff : An Analytical and Comparative Study.
9. Organisation and Finance of Joint Stock Companies in India.
10. Financing of Industries in India.
11. India's Balance of Indebtedness, 1898-1913.
12. Railway Rates in Relation to Trade and Industry in India.
13. Commercial Relations between India and Japan in modern times.
14. India in the World Crisis.



## 15. Industrial Development of Kathiawar.

*Transport*

1. The Indian Transport System.
2. Transport Facilities in Kathiawar.

*Anthropology*

1. Some of the Aboriginal Tribes of South Gujrat.
2. The Coorgs : A Socio-Ethnic Study.

*Caste and Race*

1. Untouchable Workers in Bombay City.
2. The Social and Economic Conditions of the Meghwal Untouchables in Bombay City.
3. The Pathare Prabhus of Bombay.

*Crime and Criminology*

1. Social Basis of Crime.
2. Society and the Criminal.

*Culture and Civilization*

1. Cultural Background of Art.
2. Sind Hindu Culture.

*Education*

1. Society and the Visually Handicapped.
2. Folk Dance and Physical Education, with special reference to Maharashtra.

*Ethnology*

1. Hindu Kinship.

*Social Institutions*

1. Hindu Social Institutions, with special reference to their Psychological Implications.

*Social Life and Customs*

1. Social Conditions in India as depicted in Jain Canons.

*Social Psychology*

1. Concerning Sentiments ; an Essay on the Psychology of Society.

*Social Surveys*

1. The Farmer : His Welfare and Wealth.

2. Life and Living in Rural Karnatak.

*Woman*

1. Position of Hindu Woman.

*Miscellaneous*

1. Hindu Theory of War.
2. Social Thought of Havelock El'is.
3. Social Background of Indian Nationalism.
4. Man and His Environment.
5. The Social Background of Hindu-Muslim Relationships.

*Anthropology*

1. The Katkaris ; A Study in Primitive Social Life.
2. Social and Economic Conditions of Chodrasan Aboriginal Tribe of Gujrat.
3. The Warlis ; a Study of an Aboriginal Tribe of the Bombay Presidency.

*Crime and Criminology*

1. Crime in British India.

*Culture and Civilization*

1. Desert Culture : A Study in Regionalism.

*Education*

1. Primary Education in Bombay City and Presidency in relation to Social Change and Reforms, with special reference to Female Education.

*Marriage and Family*

1. Hindu Exogamy.
2. Marriage and Family Life in Gujrat.
3. Changing Ideas on Marriage and Family.
4. Marriage and Family Life among the Kannada Castes of the Mysore State.

*Social Demography*

1. Infant Mortality in British India.
2. The Population Problem of the Parsis.
3. Geneological Study of Some Vital Problems of Population.
4. A Hospital Study of Maternal Mortality in Bombay City.



## 5. A Study of Fertility in the Middle Class.

*Social Life and Customs*

1. The Evolution of Social Ideals in Maharashtra during the 19th Century.
2. Life and Manners of 18th Century Maharashtra.
3. Social History of Gujrat from early Times upto Pre-British Period.
4. The Manners and Customs of the Muslims in the United Provinces.
5. Customs and Manners of Central Punjab.

*Social Psychology*

1. Instinct and Habit in Society

*Social Surveys*

1. Indian Christian Community in Bombay.
2. Chitpavan Brahmins : A Social and Ethnic Study.
3. The Vadnagara Nagars of Gujrat.
4. The Amil Community of Sind Hyderabad.
5. Dashashrimali Jains of Kathiawar.
6. The Nature of Poverty among the Parsis.
7. Untouchability in Maharashtra.
8. The Untouchables of Kathiawar.
9. Clerks in the City of Bombay.
10. Economic and Demographic Study of the Amils in Sind.

*Woman*

1. The Position of Women Workers in Bombay Cotton Mills.
2. Position of Hindu Woman, with special reference to Maharashtra.
3. Socio-Economic Position of Women in India from 1858 to 1929.
4. In the Wake of Emancipation—being a Criticism of Social Life and Thought of Western Woman.
5. Woman in Modern Gujarati Life.

*Miscellaneous*

1. Religion and Society.
2. Social Thought of Bertrand Russell.

3. The Problems of Social Justice.
4. The Problem of Indian Polity.
5. Drink Problem in Bombay Presidency.
6. Regional and Social Characteristics of British Philosophy.
7. Grounds of Political Obligation in Hindu State.
8. The Problem of Sovereignty in Hindu State.
9. Hindu Art in its Social Setting
10. The Press and Society in India.

### **Theses under Preparation**

#### *Economics*

1. Agrarian Tenancy in Gujarat.
2. Municipal Finance in a few leading Indian States.
3. Public Finance and Full Employment.
4. The Indian Capital Market.
5. Corporation Finance and Management in India.
6. Finance of the Bombay Government.
7. Rural Labour in the Konkan.
8. Survey of Rural Economy of Konkan.
9. The Theory of Interest.
10. The Rural Economy of Bombay Karnatak.
11. Tenancy in Thana District.
12. The Theory of Employment—A Critical Examination.
13. Pricing in Planned Economy.
14. Distribution and Economic Progress.
15. Standard of Living of the Textile Workers of the Bombay Province.
16. Taxation of Property.
17. Agricultural Marketing in Bombay Province with special reference to Marketing Cost.
18. The Co-operative Movement in Bombay.
19. The Regional Distribution of Industries in India.
20. Present Position and Future Prospects of Chemical Industries in India.
21. Exchange Banks in India.
22. State Control of Industry in India.
23. Effects of War on Agriculture in Gujarat.



24. Conciliation and Arbitration of Industrial Disputes with reference to Bombay Province.
25. The Profits and Wages in the Cotton Industry in the Bombay Province.
26. Pricing in Public Utilities.
27. War-time Inflation and its Effects.
28. The Problems of Indian Shipping.
29. Industrial Development of Maharashtra.
30. Some Aspects of Economic Progress of Cochin.
31. The Problem of International Capital Investment, with special reference to India.
32. Cottage Industries in India.
33. A Study of Sub-division and Fragmentation of Agricultural Holdings in Karnatak.
34. Industrial Relations.
35. Food Crops of Gujarat.

#### *Sociology*

1. Problems of Inter caste Marriage and its solution.
2. The Extent of Rational Thought in Educated India.
3. Recreation in its modern aspects.
4. Social Work.
5. The Social History of the Parsis in its Relation to Parsi Law.
6. Social Differentiation and Differentiation in Emoluments.
7. The Pathare Prabhus—a Social Study.
8. Agaris.
9. The Sonkolis.
10. Customs of Gujarat.
11. Hindu Music in its Social Setting.
12. The Art and Science of Dancing.
13. Jain Community—a Social Survey.
14. Life and Labour of Textile Workers in Bombay City.
15. Renascent India.
16. The Press and Modern Life in India.
17. Social Background and Educational Achievements of pupils.
18. The Social Survey of the Industrial Labour at Worli B. D. D. Chawls.
19. Juvenile Delinquency.

20. The influence of the British rule on the position of Indian women.
21. Social Philosophy of Gandhiji.
22. The Social Study of Vakkals of North Kanara.
23. Cinemas in Bombay City.
24. Beggar Problem in the City of Bombay.

## COLLEGE OF ENGINEERING POONA

### *Geology*

1. Geology of the area around Muddebihal,

### *Soil Mechanics to Engineering Geology*

1. Study of Pashan Dam near Poona.
2. Study of Rascope Dam site, Belgaum District.
3. Study of Ahmednagar site on Kapri nadi.

## FERGUSON COLLEGE, POONA

### *Geology*

1. Petrology and Geology of South Belgaum District.
2. Some Molluscs in the Intertrappean beds in Belgaum District.

### *Sanskrit*

1. Vedic Studies : Prospect and Retrospect.
2. History of the Vedic Period  
(four chapters in the History of India-Indian History Congress)
3. Antecedents and Early beginnings for the Vedic Period.
4. Progress Indology in India during recent years.
5. Civilisation in the Age of Guptas

### *Philosophy*

1. Philosophical Bases for the Social Sciences.
2. Problem of Value in Philosophy.
3. Psychological and Social Contributions of S. Freud.
4. Value and the Social Sciences.
5. Mysticism in Gujarat
6. Recent Ethical Thought (in Britain & America)
7. Psychological and Philosophical Thought of McDougall



*Botany*

1. The general life History and Embryogeny of *Gretum* sp. found on the Western Ghats is in progress.

*Chemistry*

1. Absorption of Dyes at Mercury Surface.
2. Hydrolysis Sulphonamide.
3. Kinetics of consecutive Reactions.
4. Kinetics of Hydrolysis of amides and nitriles.
5. Cryoscopic studies of polymerised oils and fats
6. Reduction of oxy-acid salts by alumino Thermic Reaction
7. Reduction of phosphates, sulphates and borates by alumino Thermic Reaction
8. Utilization of the Waste products from the manufacture of Ayurvedic Medicine.
9. Study of Heterogeneous Reaction between Chromium sesquioxide and Potassium bromate, and Chromium sulphate and Potassium permanganate.
10. Absorption studies of metallic Powders.
11. Effect of Solvents on Dipole Moments
12. Identification of spore-forming bacteria from the milk available in the markets of Poona.
13. Preparation of Active carbon from waste materials such as husks of grains and oil seeds.
14. Methane by anarobic fermentation of waste materials.
15. Micro-organisms and mineral nutrition of plants.
16. Manufacture of Yeast.
17. Oxidation of Hypophosphorus acid and phosphorous acid by hypochlorous acid.

**GOKHLE INSTITUTE OF POLITICS & ECONOMICS***Economics*

1. Cottage and Small Scale Industries of Bombay Karnatak.
2. Rural Indebtedness in Poona district.
3. The Socio-Economic Survey of Handloom weavers in Ahmednagar.
4. Some Problems of the Structure of Indian Industry.

5. Industrial Labour in Khandesh.
6. Economic conditions of Moslems in Poona.
7. Railway Rates and Special Transportation Problems of India's inland transport.
8. Indian Currency.
9. Trade in Kolhapur.
10. A Survey of occupational and Employment Structure in Malbar.
11. Economics of Fruit Growing in East Khandesh.
12. Marketing of Cotton in Gadaga.

## **GRANT MEDICAL COLLEGE, BOMBAY**

### *Pathology*

1. Causes of fevers - study of strains of typhoid and other organisms isolated from the blood.
2. Concentration method - action of metallic elements on bacteria.

### *Physiology*

1. Studies in Test of Physical fitness in Indians.
2. Studies in the Body Surface Area of Indians.

### *Biochemistry*

1. Formation function and variation of Plasma Proteins in Health and Disease. ( An inquiry under the I. R. F. A. )

## **GUJARAT COLLEGE, AHMEDABAD**

### **Arts**

#### *Politics*

1. Local Self-Government in Western India.
2. The Growth of Public Opinion in India.
3. Law and Order ( being a Study in Political and Legal Theory ).

#### *History*

1. King Sudraka - an Historical Study ( Published in the Journal of the Bombay University for 1947-48. )



*Urdu*

1. The Poets of Gujarat.
2. Urdu Poet 'Wali' Gujarati.

*French*

1. The Novels of Piere Benoit.

**Science***Physics*

1. *Work already completed*

Theoretical study of the scattering of light by large water drops with special reference to the study of Corona formation, colours of Coronas, Transmission of light, Brocken Bow, etc.

2. *Work in Progress.*

- (i) Experimental investigations of the above problems.
- (ii) Study of the Optical properties of metals, alloys and Metallic films.
- (iii) Optical study of textiles and textile fibres.

*Chemistry*

- (i) *Completed.*

- (1) Thermal Decomposition of (a) Barium Nitrite and (b) Barium Nitrate.
- (2) Action of charcoal on (a) Barium Nitrite and (b) Barium Nitrate.
- (3) Action of charcoal on (a) Lead Nitrite, (b) Lead Nitrate and (c) Lead Peroxide.

- (ii) *In progress.*

- (1) Preparation and Thermal Decomposition of Double Nitrites.

- (2) Studies in Nitrometals.

3. Synthetical antimalarials. 5-amino derivatives of nitro-methoxy acridine.
4. Synthetical anti-malarials 5-amino derivatives of trichloro or methoxy diethylamino acridines

5. Synthetieal antimalarials. 5 amino derivatives of dichloro or dichloro methoxy acridines.
6. Sythetical anti malarials-5 amino derivatives of isomeric dichloro methoxy acridines.
7. Hoffmanns degradation of substituted phtthalimides.
8. Synthetical anthelmintics. dialkoxy-phenyl butyrolactones.
9. Synthesis of sweetening agents. A new mode of preparation of sacharine and its derivatives.
10. Antileprosy drugs. phenyl alkylbutyric acids.
11. Antileprosy drugs. phenyli alkylpropionic acids.
12. Studies in Fries migration:
  - (i) Quinol derivatives,
  - (ii) Resorcylic acids derivatives.
13. Studies in Chemistry of chalkones and related compounds.
14. Studies in Fries migration:
  - (i) Phenolic acids and
  - (ii) Substituted coumarin derivatives.
15. "Hydro" as reducing agent:-  
The direct reduction of nitro to amino group in alkaline medium.
16. Studies in the Fries migration of naphthol derivatives.
17. Heterocyclic compounds derived from 4-phenacetyl-resorcinol.
18. 5-hydroxy-coumarin derivatives as indicators in volumetric analysis.

### *Biology*

1. A study of the morphology on the skull of *Lissemys punctata granosa* (Indian pond terrapin).
2. A study on the skeleton of *Calotes versicolor*
3. A study of the genus *Cercospora* in India.
4. A study of the Fungus Flora of North Gujarat.
5. A study of the Cryptogamic Flora of North Gujarat.
6. "The Cryptogamic Flora of North Gujarat (published).
7. Nematode and Cestode parasites of Fishes from Ahmedabad waters.
8. Nematodes and Costode parasites of Reptiles from Ahmedabad and round about.
9. Study of Fresh-water Plakton from Ahmedabad.



10. Circulatory system of *Hydrophis coeruleus* (sea snake) completed.
11. General Cytology of the male gonads of *Varanus monitor*
12. Histological study of the Nematode *Spirochaeta Khadrai*
13. Some Nematodes parasites of fresh-water fishes.
14. The identification of various species of *Equisetum* in India on the basis of the anatomical peculiarities.
15. The study of the distribution of various species of *Equisetum* in India.
16. The morphology and anatomy of the so-called abnormal sporophylls of *Osmunda regalis* L.-Studying in details the course of the vascular supply to the sporangia of the so-called abnormal sporophylls.
17. The identification of the species *Oxyrachis* and the detail development study.
18. Binomics of the above mentioned animal.  
Identification, classification, development and external morphology has been worked out.
19. Ecological study of *Amaranthus Spinous*.
20. Morphological Studies of the Pollen-grains of Leguminosæ.

### ISMAIL YUSUF COLLEGE, JOGESHWARI.

1. Editing of the Ma'athir -i- Jahangiri.
2. Letters of Aurangzeb - Vol. II.
3. History of Aurangzeb in the light of letters - Vol. II.
4. History of Deccani Urdu and its Grammar.
5. Nasikh and his Age.
6. History of Urdu Drama.
7. Sufi Poets of the Deccan.
8. Urdu Poets of Gujrat.
9. Critical Edition of Amin's Yusuf Zulkha.
10. A History of Vedic Rituals from the age of the Rigveda to that of the Sutras.
11. The antecedents of Vedanga Studies.
12. A Study of the Varuna hymns in the Rigveda.
13. Early Literature presupposed in the Ramayana.
14. Early Literature presupposed in the Mahabharata (Critical Edition).

15. Critical Survey of Persian Literature in pre-Mughal India.
16. India's Contribution to Persian Lexicography.
17. Urdu under Adil Shahi Kingdom.
18. Soma in the Vedic Sacrifices.
19. Early Literature presupposed in the Ramayana.
20. Study of diffraction and interference patterns with special reference to Fresnel and Fraunhofer diffraction.
21. Early Literature presupposed in the Mahabharata (Critical Edition).

## **INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR**

### *Animal Nutrition Section.*

1. Investigations on the Vitamins 'A' — Contents of Ghee and Nutritive value of Vanaspati and oils.
2. Studies on the feeding of Alkali treated straw to cattle at different centres.
3. Investigations on the Nutritive value of certain indigenous grasses and leafy fodders of India.
4. Investigation on famine fodders.
5. Animal Nutrition Survey of the typical irrigated and one typical non-irrigated village.
6. Investigations on essential and non-essential amino acids for ruminants.
7. Studies on the improvement of coarse fodders.
8. Studies on trace elements,
9. Investigations on poisonous plants.
10. Studies on fluorine intoxication.
11. Studies on the comparative physiology of feed utilisation and metabolic behaviour of cow and buffalo.
12. Investigations on seasonal variation in the blood constituents of farm animals.
13. Studies on the causes responsible for the low digestibility of certain feeding stuffs.
14. Studies on the feeding of Urea or similar salts to ruminants.
15. Studies on the influence of different sources of protein on the growth rate of calves under paddy and wheat straw feeding.
16. Studies on the Vitamin 'A' Potency of the colostrum of pre-milked and non-premilked cows and buffaloes.



*Animal Genetics Section.*17. *Endocrinology. ( Hormone Therapy ).*

- ( i ) The influence of stilboestrol on the metabolism of cholesterol and sex-steroids.
- ( ii ) The influence of stilboestrol on certain aspects of developmental physiology.
- ( iii ) The induction of overlation in anoestrous animals by pregnant Mare Serum Hormone.

18. *Reproductive.***PHYSIOLOGY ( Semen Study ).**

- ( i ) The study of buffalo semen with reference to its following constituents :—  
Calcium, phosphorus, Copper ascorbic acid and lipid.
- ( ii ) The effect of exercise on the quality of semen in bulls.
- ( iii ) Development on the technique for the differentiation between dead and live spermatozoa in animals.
- ( iv ) Transport of Semen of domesticated animals under the difficult conditions met with in India.
- ( v ) The effect of iodinated casein on the semen production of goat.
- ( vi ) Morphology and biometric study of spermatozoa from different levels of reproductive tract of sheep, goat and buffalo.

19. *Reproductive.***PHYSIOLOGY ( Continues )****( General ).**

- ( i ) The ascorbic acid content of the bovine Ovary during the various stages of its cycle and pregnancy.
- ( ii ) The ascorbic acid content of the blood of ewes at the various stages of its cycle.
- ( iii ) Study of the reproductive physiological process of Indian farm animals. ( This includes the analysis of the data collected on the reproductive physiology of animals from different farms of India ).

20. *Artificial Insemination.*

- ( i ) Study on the different methods of artificial insemination and their result on conception rates.

21. *Embryology.*

- ( i ) Development of the egg of buffalo up to the stage of Blastocyst formation.

22. *Cytology.*

- ( i ) Chromosome behaviour during meosis in the water buffalo.
- ( ii ) Chromosome studies in several genera of grasshoppers.
- ( iii ) Chromosome studies in three different genera of ticks ( Fowl, dog and cattle ).

23. *Genetics.*

- ( i ) Lubreeding experiments with some indigenous breeds of Poultry.
- ( ii ) Studies on the inheritance of milk yield and draught quality in Haryana Cattle.
- ( iii ) Evolution of a Ranikhet Resistant Strain of Poultry.

*Pathology and Bacteriology Section.*24. *Foot & Mouth Diseases.*25. *Ranikhet Diseases.*26. *Anaerobic infection of cattle, sheep and goats.*27. *Contagious Plero-Pneumonia of the goat.*28. *Encpholomyalites in equina and ruminants.*29. *Pastenrellosis of cattle, sheep and goats.*30. *The effect of pericillins and certain new anti-biotics on pathogenic micro-organism of veterinary importance.*31. *Rinderpest - New method of vaccination.*32. *Chick embyro vaccine, rabbit passage virus vaccine.*33. *Contagious agalaction of the goats.**Poultry Research Section.*34. *Breeding.*

- ( i ) Breeding experiments to evolve pedigeed strains of white leghorns, Rhode Island Reds and Black Minorces.



- ( ii ) Research into grading of Poultry (Indigenous) using exotic breed such as whiteleg-horn and Rhode Island Red.
- (iii) Breeding of improved Desi stock for large eggs, better body size and increased egg production combined with elimination of broodiness.
- ( iv ) Studies on the inheritance of egg production.
- ( v ) Studies on the inheritance of smust colour in Rhode Island Red.
- ( vi ) Studies on the inheritance of dark shauks in indigenous stock.
- ( vii ) Studies on the inheritance of feathered shauks.
- (viii) Studies on village poultry keeping.

### 35. *Nutrition.*

- (i) Research into substitute poultry feeds in place of wheat, oats and paddy as well as animal protein supplements such as milk.
- (ii) Manganese metabolism in fowls.
- (iii) Studies on calcium phosphorne balance of laying hens.
- (iv) Studies of Nitrogen balance of laying hens.
- (v) Potatoes in Poultry Rations.
- (iv) Feeding Cow-dug to poultry as supplements.
- (iiv) Mineral metabolism.

### 36. *Technology.*

- (i) Studies on the inheritance of egg faults.
- (ii) Preservation of shell eggs by heat treatment and oiling
- (iii) Research into canning table poultry.

### 37. *Pathology.*

- (i) Etiology and control of Avian lencosis complex.
- (ii) Immunology of fowl Cholera.
- (iii) Survey of salmonellosis.
- (iv) Dweation of immunity in fowls following vaccinations with improved fowl-pox vaccine.
- (v) The effect of vaccinations against Ranikhet Disease in fowls on egg production.

*Section of Parasitology*1. *Helminthology.*

Toxonomy, Bionomics, Pathogenicity and control of helminths of domestic animals and food-fishes.

2. *Entomology.*

Transmission of Rinderpest, Surra and Anthrax by arthropod vectors. Trial of insecticidal and tickicidal drugs. Biological control of ticks. Control of warbbes and theileriasis. Determination of the damage caused to hides and skins by minor biological factors.

3. *Protozoology.*

Toxonomy and biology, Pathogenicity diagnosis. Chemotherapy and Control of protozoan parasites of domestic animals.

**DHARWAR***Zoology*

1. A preliminary survey of the Fauna of the Karwar Coast and neighbouring island.
2. On some ciliate parasites (Protozoa) of Frogs and Toads of Karnatak.
3. The structure of the heart of Typhlops (T. acutus, T. Braminus)
4. The nervous system of the fish 'Pseudorhombus arsius'.
5. A Survey of the Planktonic Fauna of Kelgiri with special reference to Cladocerans
6. A study of the structure of the hearts of 'Uropeltis and Reopa
7. The complete Anatomy of the Earthworm "Haplochaetella".
8. A systematic survey of the Fresh-water fishes found in the Ponds, nullahs and tanks round about Dharwar.
9. The stomach contents of the Fresh-water fishes of Dharwar.
10. A systematic survey of the fishes of Karwar Coast.
11. The comparative studies of the scales on the pharyngeals and their teeth in Cyprinid fishes of Dharwar.
12. The systematic study of the Crabs of Karwar Coast.
13. Further studies on the Ciliate parasites of Karnatak Frogs.
14. A paper on the new species of Nyctotherus found in Rana curtipes of Castle Rock.



15. A short paper on the Digestive and circulatory systems of the Fresh-water fish 'Ophiocephalus striatus.

### *Botany*

1. The place of Algology in Agricultural Industries and Fisheries
2. "Some observations on Gnetum".
3. On the origin and development of aerenchyma in stachytarpheta indica, Vahl.
4. On the seasonal aspect and the ecology of the Fresh water tanks about Dharwar.
5. An Ecological study of the Algae of the soils of Bombay Presidency
6. The autecology of Stachytarpheta indica Vahl.
7. The ecology of the Algae in the tanks near Dharwar.
8. The Chlorococcales of the Karnatak.
9. The Phytoplankton of the west Coast of India.

### **MANEKLAL NANCHAND COLLEGE, VISNAGAR**

1. A synthesis of European and Indian aesthetics.
2. Psychological investigations of some of the voluntary processes.
3. Lyrics of medieval Gujarat.
4. A critical study of Shree Harsha's Naisadhiya-charitam.
5. A synthesis of European and Indian aesthetics.

### **THE MEGJI MATHRADAS ARTS COLLEGE AND N. M. INSTITUTE OF SCIENCE, ANDHERI, BOMBAY**

### **Arts**

#### *English*

1. The Contribution of Sri Aurobindo to Indo-English Literature
2. A. E. Housman.
3. Indian Contribution to English Poetry.
4. Somerset Maugham—A Critical Study.
5. Mysticism of Francis Thompson.
6. Indian Contribution to English Literary Criticism.
7. The Mind and Art of Eugene O'Neil.
8. Expression of personality in Literature.

**Science***Biology*

1. Embryological studies in Anonaceae.  
     Embryological studies in Sapotaceae.  
     Embryological studies in Vitaceae.  
     Embryological studies in Acanthaceae.  
     Embryological studies in Meleaceae.
2. Embryological studies in Umbelliferae.
3. Embryological studies in Umbelliferae.
4. Embryological studies in Verbenaceae.
5. Embryological studies in Mimoseae & Celastraceae Gentianaceae.

**NOWROSJEE WADIA COLLEGE POONA 1***Physics*

1. 'Automatic Musical accompaniment to Vocal Music'.

*Chemistry*

*Organic Chemistry*- Studies in heterocyclic Compounds.  
*Bio-Chemistry* - Studies in Food stuffs and Drugs.

*Biology*

1. Morphology, Sporogenesis anatomy of the New Species. *Isoetes Dixitei* Sp. nov.
2. Gametogenesis of *I. Dixitei* sp. Nov.;
3. Comparative anatomy, morphology, Sporogenesis etc., of some Indian Species of Isoetes.

*Arts.*

1. The meaning of Spirituality,
2. The Limits of Philosophy,
3. On Happiness, and
4. The problem of Body and Soul as an instance of the stand-point of Indian Philosophy.

**RAJA RAM COLLEGE, KOLHAPUR***Chemistry*

1. Mercurochrome as an Indicator in Acid-Alkali Titrations.
2. Mercurochrome as an Indicator in Halogen and silver ion titrations.



3. A Bulb-tube as a pyknometer.
4. Some reactions with Aromatic sulphides and their Derivatives
5. Fatty oil from the seeds of *Z. Xylopyra*.
6. Halogenation of some naphthel derivatives
7. Some reactions with 2-prepienyl naphthol.

*Biology.*

1. Ecological Anatomy of the Grasses of Kolhapur.
2. Ecological Anatomy of the Forest Trees of Kolhapur, with special reference to Seasonal Variations.

*Rare Prakrit Texts.*

1. Lilavai of Kouhala.  
Text, Commentary and a Critical Introduction.
2. Kuvalayamala of Uddyotana.  
Collation and critical study of the two available Mss., one from Poona and the other from Jaisalmer.

**RAM NARAIN RUIA COLLEGE. MATUNGA, BOMBAY-19.**

*Chemistry*

1. Studies in the kinetics of the reaction between Hydroxylamine hydrochloride and sodium nitrite.
2. Studies in the Synthesis of Substituted Valero Lactones. Condensation of B (4 methoxy phenyl) glutaric anhydride with Phenolic ethers, in the presence of anhydrous Aluminium Chloride.
3. Studies in the kinetics of the reaction between Urea and Nitrous Acid.
4. Condensation of the Anhydrides of B-aryl-glutaconic acids with phenolic ethers in the presence of anhydrous aluminium Chloride.
5. Reactivity of Methylene group in B-substituted glutaconic esters.
6. Studies in the Synthesis of substituted Crotono-lactones.
7. Studies in the synthesis of substituted semi-analides and Oxazine compounds from B-aryl glutaconic acids.
8. Studies in the synthesis of substituted crotono lactones.

*Botany.*

1. Floral anatomy of Scrophulariaceae,

*Zoology.*

1. Enzymes in the alimentary canal of *Harpodon nehereus*.
2. Studies on the structure of the Digestive glands of the crab & spider and the crystalline style of *Telescopium* and the enzymes produced by them.
3. Histology of the alimentary canal of *Periophthalmus*.
4. The circulatory, Excretory and Reproductive systems of *Telescopium*.

**RANI PARVATI DEVI COLLEGE, BELGAUM**

1. "Ratnakarvarni & His Times".
2. Kannada Prosody.
3. Influence of Ramanuja's Philosophy on Kannada Literature.

**ROYAL INSTITUTE OF SCIENCE, FORT, BOMBAY-1.***Physics.*

1. Preparation and study of the properties of Infra-red photo cells.
2. Temperature effect of the Sensitivity of Photographic emulsions.
3. Electron Diffraction.
4. Mobilities of gaseous ions.
5. Quantum theory of radiation.
6. Geomagnetism.
7. Mean free path of electron in solids.
8. Relative intensity variations for C<sub>2</sub>, and CH bands in discharge through Argon with carbon electrodes.
9. Excitation of Swan bands in condensed discharge through CO and study of the intensity changes.
10. Study of pendant drop method (photographic) for the measurement of Surface Tension.
11. Intensity changes in C<sub>2</sub> bands and their relation to translational temperatures in Ethyl Alcohol Flames.
12. Intensity change in the band spectra of C<sub>2</sub>, CH and CO and the C, H and oxygen lines in condensed spark under glycerine.
13. Selective excitation of spectra in L. F. discharges.
14. Study of fluorescence of certain complex dyestuffs.
15. Influence of oxygen on the band spectra of nitrogen excited in electrical Discharge.



16. Quenching of mercury spectrum by the presence of oxygen.
17. Striking potentials of L. F. discharge.
18. Electron velocities in L. F. discharge in air and hydrogen and their variations with discharge parameters.
19. Intensity changes in Swan bands in ethylene flames.
20. Broadening Phenomenon of mercury lines in vapour discharge lamps.
21. Intensity changes in CH & OH-bands in ethylene flames.
22. Influence of argon on the band system of nitrogen.
23. Dipole moments.
24. Scattered Light.
25. Solvent effect in Dipole moment measurements.

### Chemistry.

#### *Inorganic.*

1. Magnetic study of Boron compounds.
2. Conductivity measurements of colloidal systems.
3. Magnetic study of Cadmium Compounds.
4. Magnetic study of the effects of hydration.
5. Magnetic study of Silver Compounds.
6. Refining of non-ferrous metals by metallurgical processes.
7. Scattering of Light by Sols and Gels.
8. Gel Systems.
9. Magnetic study of inorganic salts of alkali metals.
10. Gel Systems.
11. Phase rule study of soap Colloids.
12. Magnetic study of alkali compounds.
13. Dezinking of brass.
14. Decomposition of alkaline-earth sulphates.
15. Oxidation of hydroxylic substances with perborates.
16. Reaction between sodium arsenate and mercury salts.
17. Oxidation with perborates.
18. Studies in sulphates of titanous and per-titanous acids.
19. Studies in solubilities of titania and alumina in solutions of alkali hydroxides.
20. Recovery of titania from titaniferous substances.
21. Utilisation of sodium sulphate.
22. Studies in solutions of Zinc hydroxide in alkali hydroxides.



23. **Electrometric Titrations of some gel-forming systems.**
24. **Beryllium and its Compounds.**
25. **Refining of Copper by a new method.**
26. **Manufacture of gelatin.**

#### *Organic.*

1. **A new synthesis of polyhydroxy benzophenones.**
2. **Dyes from diphenyl p-amino benzamidine.**
3. **Studies in Synthetic Insecticides.**
4. **Synthetic Drugs.**
5. **Preparation and Reactions of chloro Sulphonic acid and properties of Synthetic Drugs.**
6. **Substitution in resorcylic acid derivatives.**
7. **Nuclear benzylation of hydroxyketones.**
8. **Some reactions of methylorsellinate.**
9. **Action of chlorosulphonic acid on heterocyclic compounds.**
10. **Studies in Fries Transformation.**
11. **Studies in Imidochlorides.**
12. **Studies in the bromination of coumarins.**
13. **Studies in chalkones.**
14. **Studies in chromones.**

#### *Botany.*

1. **Ecological Survey of the Bombay National Park.**
2. **Studies in Nitrification.**
3. **Ecological Studies in Bombay Flora.**
4. **Ecological Anatomy of Mangroves.**
5. **Chemical Analysis of Wild Grasses.**
6. **Die Back Disease in Citrus Plants.**
7. **Nitrophilous Associations in Relation to their Soils.**
8. **Studies on the Ferns and Liverworts of Bombay Presidency.**
9. **Investigation on the Flora of the Deccan Intertrappeans.**
10. **Autecology of *Amaranthus spinosus*.**
11. **Analysis of Mangrove Soils.**
12. **Foliar Anatomy of Indian Oleaceae with special reference to Occurrence of Foliar & Terminal Scleredes.**
13. **Embryogeny of *Aegiceras majus*.**
14. **Embryogeny of *Anagalies pumila*.**



*Zoology.*

1. Studies on the Genitalia of Siphonaptera.
2. Studies on the Respiratory System of *Periplaneta australasica*.
3. Studies on Weberian Ossicles in Siluriform fishes.
4. Studies on the Nervous System of *Periplaneta australasica*.
5. External Morphology of *Periplaneta australasica*.
6. Studies on the ovaries of some Bombay fishes.
7. Plankton of Karwar & Chemical analysis of sea-water.
8. Structure and Bionomics of the Sciaenidae of Bombay.
9. Structure of Bionomics of Ctenocephalid fishes.
10. Food of Fishes.
11. Distribution and anatomy of frugivorous bats.
12. Parasites of fishes.
13. Systematics of the Prawns from Bombay Waters.
14. Circulatory System of some Bombay Eel fishes.
15. Histological studies of the alimentary canal of *Periplaneta Australasica*.
16. Embryology of the pipefish.
17. Comparative Study of the Musculature of some snakes.
18. Comparative Study of the Lung Tissue of Reptiles.

**S. P. COLLEGE**

1. The Contribution of women writers to Marathi literature.
2. Surroundings and literature-Mutual interaction as illustrated by Marathi literature.
3. K. P. Khadilkar as a dramatist.
4. Woman in Marathi literature.
5. Realism in Marathi.
6. 'Madhura Bhakti' in Marathi literature.

**SETH G. S. MEDICAL COLLEGE, PAREL, BOMBAY 12.**

1. "A Myotrophic Index" (an index based on physical measurements of a human body to assess the state of nutrition).
2. Nicotinic acid precursor from vegetable foodstuffs.
3. Enzymic hydrolysis of Nicotinic acid from foodstuffs.
4. Source of Alkaline phosphatase in rickets.
5. Nutritive value of pure bred strain of cereals and pulses.



6. A search for rich source of vitamins from waste foodstuffs.
7. Studies in Metabolism of fat.
8. Some Nutritive aspects of Cancer.
9. Cytological studies of the Islets of Langerhans (Rats) with special reference to changes with various diets.
10. The use of Bacteriophage in Typhoid Fever.
11. A Survey of the Intestinal Parasites in human population in Bombay with special reference to *E. histolitica*.
12. Anaemias of Pregnancy.
13. Laboratory Diagnosis of Small Pox.
14. Anaemias - General Enquiry.
15. Incidence and etiology of Peptic Ulcer.
16. Enquiry on "Punarnava".
17. Incidence and etiology of Rheumatic fever in Bombay.
18. Immunological properties of lens and uveal proteins.
19. Neurogenic factor in the production of shock and its treatment by the alteration of cerebrospinal fluid electrolytes.
20. The effect on liver function of -
  - (1) Vitamin B deficient individuals of large doses of Vitamin B complex and
  - (2) High protein intake on subjects with low plasma protein levels.

## SIDDHARTH COLLEGE BOMBAY

### *Sanskrit*

1. Indra-legends in the Brahmanas.

### *Philosophy*

1. The Principles of Mysticism.

### *Chemistry*

1. Chemistry of aryl-glutaconic anhydrides and anils.
2. Chemistry of aryl-glutaconic acids.
3. New sulphonylamide derivatives containing Mercury and Antimony and also containing different heterocyclic groups.



# THE SORABJI BURJORJI GARDA COLLEGE, NAVSARI

## *Philosophy*

1. "Aldous Huxley - The Artist Philosopher".

## St. XAVIER'S COLLEGE, BOMBAY 1

## *History*

1. Balaji Vishwanath.
2. Jainism in South India.
3. Rani of Jhansi
4. Ram Raya Deva.
5. Administration of Justice in Ancient India.
6. The People of the Indus Valley and Ancient Iran.
7. Foreign Influence at the Mughal Court after the Death of Aurangzeb.
8. Beginnings of the British Rule in Bombay.
9. The Meaning of Ramanuja in the Development of Indian Intellectual Culture.
10. The Holkar Dynasty of Indore.
11. Goa as described by the Travellers.
12. Plato and the Upanishads.
13. The Indian Mutiny - An Episode.
14. Some Aspects of Wellesley's Administration.
15. History of Bene Israelites.

## *Chemistry*

1. Some dyes in benzanthrone series
2. Halogenation of (i) Alizarin, (ii) A and B naphthol, (iii) and B naphthylamines, (iv) p' dihydroxy-diphenyl, etc.

## *Physics*

1. Variation of the angle of contact with concentration of a solution using optical method.

## *Botany*

1. Anatomy of the Amarantaceae.
2. Microorganisms associated with the roots of Indian Plants.
3. Anatomy of Solanaceae and Convolvulaceae.

4. Anatomy of Ferus.
5. Aquatic Plants. Physiological Anatomy.
6. Flora of Bombay and Salsette.

#### *Geology*

1. Geology of a part of the Baria State.
2. Geology of a part of the Sirohi State.
3. Geology of the Salsette Island—North and surrounding area.
4. Revision of the Geology of the Bombay Island and preparation of a geological map (large scale) of the Island of Bombay.
5. Petrological Studies in areas around Bombay and Salsette Islands Bombay.

#### *Microbiology*

1. A contribution to the studies on the normal and abnormal flora of the intestinal tract.
2. Antagonism among the intestinal bacteria
3. Bacteriology of the respiratory tract with special reference to common cold.
4. Physiological groups of intestinal bacteria and their significance to health.
5. Studies on the bacterial vaccines with special reference to the T. A. B. and C Methods of preparation and immunological behaviour
6. Sero-diagnostic method for the diagnosis of typhoid fever—precipitin reaction.
7. Chemotherapy of tuberculosis.
8. Carbohydrate metabolism of some Indian Fruits.
9. Chemical and Microbiological studies on the Bombay Duck. (Bombil. Harpodon neherens).
10. Production of Rancidity in cocoanut oil
11. Studies in dental caries and pyorrhoea and their influence in the microflora of the intestinal tract.
12. Normal flora of the gastro-intestinal tract as revealed by the enrichment culture techniques.
13. a. Chemical and microbiological investigations on some indigenous drugs.  
b. Search for fibre-yielding plants to substitute Jute.  
c. Association of *algae* in plants.



## TILAK COLLEGE OF EDUCATION, POONA 2

### Education

1. Group Test of Intelligence for Marathi Speaking children.
2. Time Sense in children.
3. A Study of the Physical Abilities of girls from 6 to 18.
4. Development of the Language and Thought of Marathi speaking children between the ages of 10 to 17.
5. Achievement of children in Arithmetic between the ages of six and ten.
6. The study of the results of Basic Education.
7. Child Delinquency in India.
8. Examination of General Science as a Subject at the Secondary Stage.
9. History - The Claims or otherwise of its inclusion in the Curriculum of children between 7 to 15,
10. Grading items for Basic Curriculum.
11. Women's Higher Education during the last 50 years and its Social and physiological effects (Maharashtra only).

## TATA INSTITUTE OF FUNDAMENTAL RESEARCH

### BOMBAY 26

1. *Modern Algebra.*
  - (a) Theory of groups, rings and fields.
  - (b) Topology - Theory of measure and integration.
2. Tensor Analysis, Statistics and the theory of Differential Equations.
3. *Theoretical Physics*
  - (a) Quantum Mechanics.
  - (b) Theory of Elementary Particles.
3. *Cosmic Radiation & Nuclear Physics.*
  - (a) Study of Cosmic Radiation with the Wilson Chamber.
  - (b) Measurements of the Azimuthal effects of Cosmic radiation.
  - (c) Determination of the sign and the energy spectrum of primary cosmic radiation.



- (d) Measurement of the intensity of the cosmic radiation at high altitude with radio sonde balloons.
- (e) Applications of the photographic technique to research in nuclear physics.

## GOVERNMENT BOMBAY VETERINARY COLLEGE

### Bacteriological Research

1. Flora of wounds on the body surface of animals.
2. Mastitis in cattle and buffaloes.
3. Chemical and Bacteriological study into Bombay City milk.
4. Pathogenic role of *Corynebacterium pyogenes* in animals.

### Publications

1. A Preliminary Report on the Incidence of *Corynebacterium pyogenes* in animals in India. *Ind. Vet. Jour.* 1948 Vol. XXV. p. 62.
2. Research into Indian City Milk - Chemical and Bacteriological Examination *Jour. Vet. Scie and Anim Husb.* (in press.)

### Subject for research during the year 1948-49.

1. Research into Indian City Milk - Chemical and Bacteriological examination.
2. Research into the incidence of *Corynebacterium pyogenes* in animals.
3. Flora of wounds on the body of domestic animals.
4. Disease agents of Mastitis in general and *Streptococcus agalactis* and *C. pyogenes* in particular in Mastitis cases.
5. Diagnosis of Haemorrhagic Septicaemia in cattle and buffaloes.
6. Diagnosis of Anthrax in domestic animals.
7. Undiagnosed disease conditions.

## VITHALBHAI PATEL MAHAVIDYALAYA.

### Chemistry

1. Studies on the oxidation of different cereal starches.
2. To study the digestibility of modified starches.
3. To study the interaction of halogenated hydrocarbons with phenolates.



4. Application of coumarin—derivatives in acidimetry and alkali-metry.

## WILSON COLLEGE, BOMBAY 7.

### *Physical Chemistry.*

1. Studies in attraction of Fuller's earth.
2. Studies in the hydrolysis of ferric salts under varying conditions.
3. Studies in charge and stability of colloidal solutions eg. aluminium hydroxide, Prussian blue, Uranium hydroxide etc. under varying conditions.
4. Kinetics of reaction between potassium persulphate and potassium iodide in the presence of protective colloids under varying conditions of temperature and PH.

### *Biochemistry.*

1. Studies in the determination of the nutritive values of some Indian pulses by chemical as well as biological methods under varying conditions.
2. The extraction of pigments and separation of B carotene from leafy vegetables of Bombay under varying conditions and its estimation by Chemical and Biological methods.

## CALCUTTA

### Arts.

#### *English.*

1. Application of Eastern Categories of thought to English Poetry.

#### *Sanskrit.*

1. Vedanta Philosophy in its latest development based mainly on the Advaitaniddhi of Modhusudana Saraswati in conflict with the Madhava and Ramanuja School.
2. 'Tarka' Nyaya-Vaisesika Logic.
3. A work in Bengali on Sanskrit Poetics.
4. 'Raja Vijayanataka'.
5. Srimadbhagavatam with commentaries and detailed exposition in Bengali.

6. A philosophical treatise on Gaudiya Vaisnavism named 'Sarasangraha'.
7. "Hindu Panel Philosophy".
8. 'Catalogue of Manuscript'.
9. "Indian Politics".
10. Prayoga.
11. Sabara Bhashya Vyakhya.
12. The third volume of Nyaya manjari with explanatory notes and Bengali translation and the 4th and 5th Ahnikas of Nyaya manjari with critical notes.
13. Ahimsa.
14. Mahatmaji's Ahimsavada.
15. India's Independence and Congress.
16. Sanskrit Education and its Revival.
17. Hindu Dharma,
18. Karma Vada.
19. Mukativada, etc.
20. Parjabekhan— (dealing with the cultural unity between Hindus and Muslims).
21. Swaraj O Sangathan— (Hindu conception of Swaraj and Organisation of the Society).
22. Dharma O Swadhinata— (the relation between Hindu religion and Independence).
23. Giridhar Sambardhanam— Sanskrit original 'Vyayoga'.
24. "Bidhi Biparjasham" A Sanskrit original comedy.
25. "Purusaramanium" A Sanskrit original comedy.
26. "Jagradvaratam" A nine act Sanskrit drama dealing with the life of Subhaschandra and with characters of all the leaders of Bengal.
27. The translation in Bengali and a critical edition of the Uttara-dhyunasutra a very important work in Jaina Canonical literature.
28. The translation in English and a critical edition of the Bhagavati Sutra, a Jaina Canonical work which is the fountain source of all later philosophical developments in Jaina thought.
29. The second part of the work. 'Toeism and Indian thought'.
30. Articles on Indian Culture and Chinese thought in different periodicals.



*Pali.*

- (a) An Assam tour for the collection of materials for a comprehensive history of Assam.
- (b) Notes on the second copper plate of Indrapala and Prakrit of Pre-Ahom times.
- (c) Common ancestry of the Pre-Ahom rulers and some other problems of the early history of Assam.
- (d) Buddha's doctrine of the mean.
- (e) Buddhism and its psychological foundation, a chapter written for the Twentieth Century India.
- (f) Asoka : His role on History.
- (g) Some Bharhut sculptures in the Allahabad Museum.
- (h) The year of commencement of the Buddha Era.
- (i) Buddha o-taur Sishyagan.
- (j) The Saugor Copper Plate.
- (k) Asia : Past and Present.
- (l) Kabiparicay written in Assamese as a foreword to the Assam's Anthology, Assam.
- (m) Philosophy of Progress.
- (n) Undertaken to write a book on Indian Philosophy in four volumes.
- (o) Mulasarvastivada Vinayavastu, Vol. III, an edition based upon the Gilgit Manuscripts.
- (p) Completed researches relating to the Vinaya Literature in China.
- (q) Linguistic Medium of the Sarvastivada School.
- (r) Mula Sarvastivada Pratimokhsasutra- an edition based on the Gilgit Manuscripts.

*Arabic and Persian.*

1. Edited in Persian a portion of Rawjat'ul Jannat— A history of the Herat from the earliest times to A. D. 1474.
2. Edited in Persian a portion of the Haft Iqlim— A geographical and anthological encyclopaedia of Amin Ahmed Razi.
3. Edited the 'Indo-Iranika', the quarterly organ of the Iran Society.

*Modern Indian Languages.*

1. Bangla Sahityer Katha, a book of about 300 pages containing a



collection of literary essays published in various monthly magazines during the last twenty years.

2. **Bangla Upanyasa**—A small book of 150 pages published by the Visvabharati in its Lokasiksha Series, giving a brief, popular account of the origin, growth and development of the Bengali novel.

Among works yet unpublished may be mentioned the second edition of **Bangala Sahitye Upanyaser Dhara** and preparation of a critical edition with commentaries on the padas of Jnanadas in collaboration with Pandit Harekrishna Sahityaratna, as also a number of critical articles and addresses delivered at literary conferences.

Another work which has been sent to the press is a collection of critical literary essays compiled from 1850 to 1900, covering about 1000 pages, done with the collaboration of Mr. Prafulla Chandra Pal, Research Assistant.

3. Published the second volume of his **History of Bengali Literature**, dealing with the section of translations and adaptations from Sanskrit.
4. Published a critical study of the novels of Rabindranath entitled '**Upanyase Rabindranath**'.
5. Published work on '**Obscure Religious Cults as a background of Bengali Literature**'.
6. Completed a **History of Pre modern Bengali Literature in Bengali (Prachin Bangla Sahityar Itihash)** of about 550 pages.
7. Prepared a criticism on **Old Bengali Literature** of about 400 pages (**Prachin Bangla Sahityar Katha**) for publication.
8. Made considerable progress *re* **Topographical account of Bengal** (chiefly from the sources of Old Bengali Literature).
9. Made some progress *re* the editing of Manik Datta's **Chandi-Mangal**—the first Bengali poet of this type of Old Bengali Literature (12th--13th century A. D.)
10. Research work on the social condition of Bengal in the 14th and 15th centuries, which formed the background and supplied the inspiring motive to the translations and adaptations from the religious classics during the mediæval period of Bengali Literature.



11. A Study of Vaishnava Literature.
12. Collection of critical essays from 1850 to 1900.

*Comparative Philology.*

1. "Kol Jati Samskriti".
2. (i) Characteristics of Rajasthani, (ii) Origin of Rajasthani, and (iii) Rajasthani vs. Hindi.
3. "Kavi Jayadeva" — A literary and linguistic study of Jayadeva.
4. Completed the printing of Linguistic study of the *Uktivyakti-Prakarana*, a 12th Century Sanskrit-Bhasha work (Old Kosali).
5. "Daraph Khan Ghazi".
6. "New Turkish Nationalism and the Oguz-Nameh" (Navya Turki Jatiyata O "Oguz Nama" Kavya.
7. "Languages in India and Indian Unity".
8. "A Pan-Indian Language and Script for Lawyers and Laymen".
9. "The Contribution of the Mongoloid Peoples in the Evolution of History and Culture in Eastern India".
10. "Foreign Transcriptions of Indian Names and the Speech of the Punjab" proofs seen, but all material for the Volume probably destroyed in the Punjab Communal Riots.
11. "Basic Hindi".
12. Historical and comparative study of the technical terms of Sanskrit Grammar.
13. "A critical study of Sarva Varman's Kantara".
14. "Sabda Katha".
15. Etymological Dictionary of Old and Middle Bengali.
16. A critical edition of the Old Bengali Caryas.
17. A monograph on Vidyapati and his School of Maithil Poetry.
18. Papers in Bengali, such as 'Mohammadan Poets of South Radha' and 'Mathematical Verses in Middle Bengal'.

*Philosophy.*

1. A paper entitled "General Will".
2. A paper entitled "Degrees of Goodness and Badness".
3. A paper on 'The Concrete Universal'.
4. A paper on "The Nature of God".
5. A paper entitled "What is Philosophy?"



6. A paper in Bengali entitled "Sangshaibad"
7. A paper entitled "Advaitist Metaphysics".
8. A paper entitled "Sri Arabin̄da and Bergson."
9. A paper entitled "Social Disintegration".
10. A paper entitled "Object and Content".
11. A paper entitled "The Criterion of Reality".
12. "Rousseau" which deals with his Social, Political, Economic and Educational theories; with special attention to the study of such problems as the influence upon marriage and the family of modern civilization, the remedies of the evils which have appeared on the social structure as a result of modern civilization.

### *History*

1. 'Evolution of the Khalsa, Vol. II'.
2. Polier's 'A Narrative of the Transactions at the Court of Delhi from the year 1771 to the present time
3. Extensive researches in the Calcutta High Court records and some of the results.
4. Hyder Ali. Vol. II.
5. 'The French in India—First establishment and Struggle.
6. 'Cross Currents of Science and Philosophy.'
7. 'Towards the Making of the Indian Constitution'.
8. (i) The Constituent Assembly of India.  
(ii) The Making of the Indian Constitution.  
(iii) 2nd edition of 'Indian Constitutional Documents' being prepared.
9. Evolution of Political Franchise in British India.
10. Lessons from the Constituent Assemblies of the British Dominions.
11. The Concept of Democracy.
12. The Political Principles and Methods of Deshabandhu. C.R. Dass

### *Ancient Indian History and Culture*

1. Fifth edition of the Political History of Ancient India.
2. Hindu Temple with painting and sculpture, besides elucidating Buddhist History in the Trans-Gangetic Region.
3. "New Asia",
4. 'Sakas'.



5. Tibetan Bnddhism.
6. History Geography and Culture of Bengal in its varied aspects.

*Islamic History and Culture*

1. "Bairam Khan Khan Khanan".
2. 2 chapters to the History of India on the Khaljis.
3. Chapter on the Independent Sultanah of Bengal for the History of India.
4. 'A Farman of the Mughal Emperor Muhammad Shah'.
5. Worked on the Mughal documents lying at the Burdwan Raj Palace.
6. Published serial History of the Muslim Coinage (*re* Mughal Period) in Bengal.
7. Chapter on the history of Art an Architecture of Northern India. (325 B. C. to 320 A. D.)
8. Birds in Mughal Art.
9. Portraits in Mughal Art.
10. Two Seal Matrices of the Gupta Period
11. Sihadeva, a forgotten king of Nepal.

*Economics*

1. On comparative industrialism prospects of industries in Free India, cheap money, Indo-Pakistan, Economic relations, and multilateralism vs bilateralism.
2. In Politics:—On universal suffrage, forms of freedom, forms of imperialism, Asian movement in India etc.,
3. In Sociology:—On housing and health, crimes and punishments, acculturation, technical education, etc.
4. Settlement of Sterling Balances:—A study in the context of the American and Argentine Agreements.
5. Recent Banking Development:—Lessons of the Depression and the War (second edition).
6. A paper entitled 'Some Aspects of Cheap Money Policy.'

*Pure Mathematics*

1. Light and Matter giving a new classical theory, based on the Maxwell Equations and the special Relativity Theory.
2. Parallel Displacement and Scalar Product of Meteors.



3. On the identity Elements of a Quasi-group.
4. Quasi-Ordered Set.
5. On Algebraic System.
6. Geometry of Circular Cubics
7. Circles of Double Contact of a Bicircular Quartics.
8. Circular Cubics and Bicircular Quartics.
9. Bilinear Transformation of a Bicircular Quartic.
10. Note on Cremona Transformation, connected with a Cubic.
11. Mutual Intersections of a Bicircular Quartic, a Circular Cubic and a Circle.

### *Psychology*

1. Psychological Conditions of Peach.
2. Is G. factor an Act of Attention ?
3. The Concept of Evolution in Indian Thought.
4. 'Culture Conflict' and Criminal psychology.
5. *Factor analysis* of a battery of performances tests.
6. Whether communal conflict was instinctive.
7. The question of traffic accidents as caused by accident-prone drivers.
8. Correlation between L and M forms of the Terman-Merrill tests.
9. Some interesting phenomena in paranoia cases.
10. "Psycho-Biological Aspects of Psychoses".

### *Anthropology*

1. Report on Santals
2. Report on Municipal Labour in Calcutta.
3. A Preliminary note on comparability of measurement.
4. The Korku village and house type in Melghat.
5. A Santal scissors trap.
6. Santal Economy in Bengal.
7. Notes on land Tenure and Law of inheritance among the aboriginal people of Assam.
8. Acculturation in a tribe of Chota Nagpur.
9. A study of the surnames of the Varendra Brahmans of Bengal.
10. Tradition regarding the migration of the Vaidika Brahmans in Bengal.
11. A study of head hair of the Parois—a fishing caste of Bengal.



12. Study of the voluntary movements of hand as recorded by Dynamometer with pleasant and unpleasant stimuli.
13. Book insects and preservation.
14. 'Socio-economic study of the Parois' a fishing caste of Bengal.
15. Techonological study of the fishing methods of a fishing zone of Bengal.

### *Applied Mathematics*

1. Composition of stars of small masses.
2. Flexure of an isotropic elastic cylinder.
3. Helium content of stars of small masses.
4. Convergent Integrals & their application to Mathematical Physics
5. Slow homologous contraction of stars.

### **Pure Physics**

#### *Nuclear Physics*

1. Theoretical work on nuclear energetics has been continued and a report on Uranium fission completed.
2. Latest developments in the Cyclotron technique.

#### *Cyclotron*

1. "Concerning the use of a 920 Photocell in a current amplifier and stabilizer circuit".

#### *Cosmics Rays*

1. Low energy mesotrons have been separated from electrons by the use of an anticoincidence and Wilson Chamber technique. This method shows great promise for studying the properties of slow mesotrons.
2. The mesotron intensity under iron shield was taken for more than one year to find out the correlation factor of mesotron intensity with upper air temperature.

#### *Upper Atmosphere*

1. Theoretical research on the propagation of electro-magnetic waves in their upper atmosphere has been continued under B. S. I. R. scheme and several papers contributed to Indian Journal of Physics.

*Electronic*

1. Several important contributions have been made by members of the laboratory on circuit phenomena. An Electron microscope is in the process of installation in the laboratory and it is hoped that it will soon be ready for Biophysical investigation.

*X-rays*

1. X-ray investigations on cellulose under different treatments.
2. List of papers published from the Palit Laboratory of Physics, Calcutta University, under the guidance of Prof. M. N. Saha during the session 1947-48:—

*Nuclear Physics*

1. On Nuclear Energetics & S-activity II.
2. On Nuclear Energetics & S-activity III,
3. Complementary series and conjugate fragments in  $\text{U}_{238}$  fission,
4. Study of  $\text{RaE}$  B-spectrum from absorption measurements.
5. Coincidence Experiments on  $\text{Co}^{60}$

*Cosmic Rays*

1. Method of separation of low energy Mesons from electrons.

*Relativity*

1. On a class of Exact solutions of Einstein's field equations,

*Upper atmosphere*

2. On the propagation of e. m. waves through the upper atmosphere
3. On the condition of escape of microwaves from the sun.

*Electronics*

1. A Circuit for the control of Ionizing current by a saturable core transformer.
2. Linear tune base using OA4G tube.

*X-rays*

1. On the structure of hydrated cellulose from raw jute fiber.
2. On the acetylation of cellulose in raw jute fiber.
3. The influence of temperature and concentration of reactive solutions on mercerisation.



4. On the size of miscelles in jute fiber of different quantities and of known strength.

#### *Raman Effect*

1. On the Raman spectra of solution of Ethylene Dibromide in different solvents.
2. On the Raman spectra of a few nitrites at low temperature.

#### *Applied Physics*

1. Electrical properties of Indian mica as well as the properties of Indian vegetable oils to ascertain their suitability as electrical insulants.
1. In the Communication Engineering Section, frequency modulation, ultra-high frequency interference, and distribution of gases in the upper atmosphere.
2. Paper on the distribution of molecular and atomic oxygen in the upper atmosphere.

#### *Pure Chemistry*

##### Magneto-Chemical Studies in Valency and Molecular Constitution —

1. Part III—Heteropolymolybdates and tungstates with polyvalent metal atoms in the Complex.
2. Part IV—Tetrapositive Nickel Periodates.
3. Part V—Valency of Nickel and Nature of the Bond in Arsenical Nickel Ores.
4. Two modifications of Copper N—diethylbiguanide.
5. Studies on imperfect complex salts by physico-chemical methods.
6. Investigation on the chemical composition of Tipper's collection of rare earth minerals in India.
7. Investigations on the geo-chemical age of the rare earth minerals in India.
8. Extraction of thorium, cerium and phosphoric acid from monazite sand.
9. On the electrical properties of simple and complex colloids.
10. On viscosity and stability of emulsions.
11. On electro-deposition of metals on non-conducting surfaces.
12. On the enzyme systems involved in carbohydrate oxidation.

*Published Papers*

1. Studies and Ferric-thiosulphate complex by calorimetric method.
2. Studies on complex carbonates of uranium by thermometric and conductometric methods.
3. The purification of Carbon rods for spectrographic analysis by cathode layer arc.
4. The spectrographic determination of gallium in Indian bauxite by the cathode layer arc.
5. Gallium content in Indian bauxite.
6. On the cathode-luminescence spectra of Indian fluorites, containing rare earths.
7. Fluo-beryllates.

*Papers communicated for publication*

1. Studies on zinc-iodide complexes by thermometric and conductometric methods.
2. A note on basic nitrates of uranium.
3. Chloro beryllates.
4. Ferri-sulphuric acid.

*Papers ready for publication*

1. Basic sulphates of bivalent metals, Part IV (Be).
2. Basic sulphates of hivalent metals, Part V (Ni).
3. Cathodo-luminescence spectra of Indian calcite, limestone, dolomite, aragonite and apatite.

*Applied Chemistry*

1. Biosynthesis of Ascorbic Acid.
2. Nutritive value of Vanaspati Ghee.
3. Nutritional availability of food iron.
4. Oxidation of Fatty Acids.
5. Low Temperature Carbonisation of Indian Coal.
6. Chemical Utilisation of Jute waste.
7. Nutritive value of Seed Cake.
8. Fermentative production of acids and solvents from molasses.
9. Microbiology of Cereals grains.
10. Retting of Jute



11. Vacuum D-hydration of Fish.
12. Investigation into the causes of rancidity of ghee.
13. Rancidity of ghee in storage.
14. Catalytic production of acetone from methanol.
15. Utilisation of Animal Glue for Plastic and Fibre.
16. Durability of Glass.
17. Production of Phosphorus Halides.
18. Studies in Ganges' Silt.
19. Catalytic Decomposition of Sodium Chloride.
20. Biochemistry of Snake Venoms.
21. Activation of Clay.
22. Disinfectants and Insecticides.

### *Botany*

1. The following papers are in the Press for Publication .—
  - (1) Lichen Flora of India.
  - (2) Economic uses of Indian Lichens.
  - (3) Prospect of cultivation and systematic Study of the Tung oil yielding trees in India.
2. The printing of *Bharatiya Banaushadi Parichaya*, a monumental work on the medicinal plants of India written in Bengali, is nearing completion. "A Text Book of Botany for Indian Universities." "A monograph on Studies on Tung Oil Yielding Trees on India." (Published)
3. A third paper on the Economic uses of Indian Lichen has been accepted by the Indian Council of Agricultural Research for publication in their journal. The book entitled "The Science and Scientist in the Netherlands Indies" edited by Pieter Bonig and Frans Verdoorn a monumental work of international importance, was exhaustively reviewed.
  1. Paper on "The Cytological Aspects of the Nature of Sex in Plants".
  2. Paper on "Apospory in *Osmunda Javanica* BC.
  3. Cytogenetics of Mango and Banana.
  4. The Development of Female Gametophyte and seed of *Coccinia indica*.
  5. Theory of Fragmentation of Chromosomes and Evolation of Species (published).



*Work done*

1. Life history of *Typhonium trilobatum* Schott.
2. The development of female gametophyte and seed in *Coccinia indica*.
3. A contribution to the embryology of some Compositae.
4. Cytological Investigations in some common Cucurbits with special reference to Fragmentation of Chromosomes as a Physical basis of Speciation.
5. Important results of Agricultural importance showing earliness and increased grain yield of rice by vernalization method have been obtained and these are now to be repeated in field plots for adopting the method in agriculture.

*A list of Research papers (1947).*

1. Effects of high temperature and short days on vernalization response of summer varieties of rice.
2. Nutritional requirements of plants.
3. Vernalization and photoperiodism in the tropics.
4. Vernalization and photoperiodism of rice.
5. Studies in the physiology of rice IV. The effect of photoperiodic induction on nitrogen metabolism of winter paddy.
6. Studies in physiology of rice.
7. Vernalization response in two varieties of winter paddy.
8. The role of Plant physiology in crop production.
9. Physiological studies on the effect of colchicine on rice.
9. Effect of high temperature treatment on rice seeds.

*Publications.*

1. Investigations on the early flowering of Jute (*C. Olitorius*) sown in March.
2. Photoperiodic effect on *Sesamum indicum* Linn.
3. Leaf Heteromorphism and Photoperiods in *Sesamum orientale*.
4. Variation of Osmotic Values in Jute Plant.

*Physiology.*

1. A method for investigation into the cardiac output in frogs.
2. A method of investigation of energy output in small animals.



3. Study of Chorchorin, a cardiac glucoside on heart and involuntary muscle.
4. Studies of the effect of various cardiac drugs, including Chorchorin on the isolated heart tissues cultivated in vitro.
5. Effect of processing on the Biological value of proteins.
6. Nutritional evolution of triglyceride fraction of natural and processed fat.
7. On the intimate nature of the action of cobra venom on muscular contraction.
8. Effect of spirochin hydrochloride on heart and circulation.

#### *Geology.*

1. Study of the fossiliferous limestone from Jind State.
2. Study of the nature and distribution of mineral matter in various coal samples obtained from the Gondwana and Tertiary formations by means of X-rays.
3. Petrotectonics studies of the granites of Manbhum.
4. Investigations on the heavy minerals of the L. Gondwana sandstones from the Raniganj coalfields.
5. Study of zonal metamorphism in the Darjeeling and Sikkim Himalayas.
6. Study of the Geology and economic mineral deposits in the neighbouring areas of Chakradharpur, Singhbhum District.
7. Field work in the Darjeeling and Sikkim Himalayas of zonal metamorphism.

#### *Zoology.*

1. Researches on fresh water and estuarine fishes of Bengal.
2. Published a paper on biology *Aphid* and researches on Termite in connection with Damodar Scheme.
3. Tea-pests of Jalpaiguri District.
4. Published a paper on the morphology of Coeca birds.
5. Researches on Helminthology.
6. Papers (i) on Coccidia para of Indian Birds, and (ii) Myxosporidian parasites in fishes.
7. Published a paper of Chromosome structure and behaviour of grasshoppers.



8. Researches on fish and fisheries and published 3 papers in this connection.

### *Statistics.*

1. Studies in the recursion relations and properties of multivariate distributions, and on applications of statistical methods to certain types of educational and agricultural problems.
2. Studies in sampling techniques, derived the formula for the general case of "double sampling" with several concomitant variates and also reviewed some of the sample surveys actually conducted in India in recent years.
3. Researches on analysis of designs, on the optimum properties of various statistical tests and the problem of using these tests in sequential analysis.
4. Studies in the optimum properties of multivariate tests and researches on theory of testing of composite hypothesis.
5. "An outline of some modern theories of statistical inference.
6. Parametric relations in multivariate distributions.
7. On recursion formulae, tables and Bessel Function populations associated with the distribution of classical  $D_2$ -statistics.
8. An approximate method for grouping characters in Anthropometric measurements.
9. An application in multiple factor analysis.
10. Crop-estimation in India.
11. A survey of the Bengal Famine (Review).
12. Bias introduced by changing the system of stratification.
13. Some surveys for yield-estimation of paddy (Review).
14. A mathematical set-up leading to analysis of a class of designs.
15. Tests of significance on multivariate samples.
16. Sequential tests of composite hypothesis.
17. Tests of significance based on conditional probability.
18. On an optimum property of multivariate tests obtained from linear compounds of the variates. An outline of some modern theories of statistical inference ; Presidential address of the Section of Statics, Indian Science Congress, 1948.

### *Geography.*

1. Atlas of Bengal containing 76 original maps depicting climate



physiography, river conditions, soils, agriculture, Industry and demography:

2. Geopolitics of Western Europe.
3. Geography and National Planning.
4. Partition of Bengal—A Geographical Study with maps and diagrams.
5. Map of Bengal showing distribution of muslim and non-muslim population.
6. India—the basis of her strength—a Geographical Study.
7. Some Problems on Snow Survey in Eastern Himalayas “in the Journal of Royal Asiatic Society of Bengal.
8. A detailed study of the possibilities of multipurpose development of the Mahanadi River.

*Subjects of Scholarships and Prizes.*

1. (a) Theory of the Screen Cathode ray Spectrometer.  
(b) The Transmission Co-efficient of Potential Barriers.  
(c) Theory of the 1800 Magnetic Focussing-ray Spectrometer.  
(d) Investigation of the Spectrum of radiations of S 35, Rb 87, and Ra D with the screen cathode ray Spectrometer.
2. On the propagation of Supersonic waves through liquid and solutions.
3. A Theory of Judgment.
4. A Study in Language and Meaning.
5. A Glimpse into the East India Company's Administration in Bengal.
6. Cytogenetics of *musa* and fragmentation of chromosomes as a Physical basis of speciation.
7. The problem of Price Control and Rationing with special reference to Bengal.
8. Geography of Ancient India.
9. Investigations on—
  - (1) Production of Vacuum tubes in the Electrical Engineering Department.
  - (2) Microwave technique in the Marconi School of Wireless.
10. Modern Synthetic technique in Alciyclic Organic Chemistry.
11. Electrometallurgy and Electroforming and other related industry.

12. Law of Master and Servant in British India.
13. Law of Landlord and Tenant in Urban areas.
14. Moslem Law of Wakf and Endorsements.
15. Law relating to Mines and Minerals with special reference to India.
16. Social Legislation with special reference to India.
17. Epigraphic Data for Ancient Indian Geography.
18. Prices and Wages in India in the Post-War period.
19. Planned production of food.
20. Determination of the Biota ( Flora and Fauna ) of the Bengal ponds with their seasonal variations to correlate the food of fresh water fish.

### **Ashutosh Museum**

#### *Papers and Publications*

1. On the evolution of manuscript and scroll paintings of Bengal.
2. Banglar Bhaskarya in Bengali as a guide book to the Museum collection.
3. Book Insects and Preservation.
4. Clay ornaments from Sisupalgarh.

#### *Teachers Training Department*

1. Published a 'Education in Modern India:'
2. Prepared a glossary of Bengali technical terms relating to education.
3. Published :
  - (a) Secondary Education in Bengali. Its Past, Present and Future.
  - (b) Psychology of Discipline, and
  - (c) Need for 'Nursery School Education in India and English Spelling.
4. Educational Psychology of the Ancient Hindus.
5. Monograph on Case Studies in the Behaviour Problems of School Children.
6. Parent-Child relationship and Child's Self-regarding Sentiment.



**DELHI***Mathematics*

1. Hydrodynamics and theory of Elasticity.
2. Finite strain in Elastic Bodies.
3. Astrophysics.

*Economics*

1. War-time Economics Controls.
2. An Economic Survey of Cottage Industries in U. P.
3. Agricultural Labour in India (Delhi Region).
4. Economics Control in India. - 1939-46, a Historical and Comparative study.
5. Industrial Location. in India.
6. Life and Labour in South East Asia.
7. Some aspects of Indian International Trade.
8. Public Expenditure in India 1919-1939.
9. Problem of Economics Agriculture.
10. Capital Market in India.

*Philosophy*

1. The absolute and the Idealship approach.
2. The value and character and problem of value.
3. Social Science and Philosophy.

*History*

1. Government of Indian Railways.
2. Presidentship of Indian Legislative Assembly.
3. Local Self Government in Delhi Province,

*Hindi*

1. Growth of Dramas in Hindi Literature.
2. Critical Study of Radha Ballabh.
3. Studies in Hindi Mahakavya during the 25th Century.
4. Contribution of Women to Hindi Literature.

*Sanskrit*

1. Geography of the Mahabharat.

2. Manners and customs of the ancient Aryans.

### *Chemistry*

1. Studies in Products related to Biochanins.
2. Studies in Chemical Examination of Important indigenous drugs
3. Chemistry of Plant products.
4. Chemical Examination of some plants.
5. Investigations on the Chemical Constituent Melia Qzadirachta.

### *Physics*

1. Ultrasonics with special reference to their absorption and dispersion in liquido.
2. Quantum Mechanics.
3. Theoretical Physics.
4. Theory of Fundamental Particles.
5. Physics Microwaves.
6. Application of the theory of numbers to Physics.

## **EAST PUNJAB**

### **Arts**

#### *Economics*

1. Economic Development in Faridkot State from 1934 to 1938.
2. Economic foundation of Punjab Rural Society.

#### *Mathematics*

1. Some results in theory of number.

### *History*

1. Indigenous Education in the Punjab until annexation with special reference to the time of Sikhs.
2. North West Frontier Policy of Government of India 1948.
3. The Kingdom of the Punjab from 1935-1945.

### *Geography*

1. A Regional and Economic survey of Kangra District.
2. Kashmir Agriculture and Economic Geography.
3. A Regional Geography of Bist Jullundur.



4. Regional and Economic survey of Kangra Valley:
5. Regional survey of Kashmir Valley.

#### *Hindi*

1. Hindi Drama from its rise to the present day.

#### *Sanskrit*

1. English translation of Rig Veda-Adi Bhashya Bhumika of Swami Daya Nand with introduction.
2. Legends of Aetareya Brahmana.

#### *Persian*

1. Sufism.
2. The study of Shaykh Iraqi's and his Lamaat.

### **Research Work Completed**

#### *Geography*

1. Formation and reclamation of Thur soil in the Punjab.
2. Furit growing in the Punjab.
3. Agricultural Geography of Rachna Doab.
4. A Regional and Economic Geography of Gurdaspur Distt.

#### **Science**

##### *Chemistry*

1. Magnetic Study of Molecular compounds and Per-Iodates.
2. Di-Pole moment of Molecular compounds.

##### *Physics*

1. Methodical theory of location of Railway Bridges and other contributions to Railway Statistics.
2. Metabolison of Ascorbic Acid.
3. East West Asymmetry of cosmic radiation sunspot activity, and cosmic ray intensity.
4. Study of tracks of nuclear particles by Photographic method.
5. Studies on Nitrogen after glow.
6. Studies on G. M. Counters.
7. Studies on Cosmic ray showers.
8. Preparation of nuclear research plates.

*Botany*

1. Mycorrhiza in West-Himalayan orchids.
2. Cyology of some Indian liverworts.
3. Embryology of some Euphorbiaceae and Apocyanaceae.
4. Diseases of Guava Calotropis.
5. Life History of the rust on asphodelus.
6. Embryological studies on authoceros.

**Research Work Completed***Botany*

1. Chromosome number in Cryptomitrium-Himalayense.
2. Chromosome number and the effect of Colchicine on chromosomes of Cobchim Leuteum Baker.
3. The structure and development of the female and male gametophytes in cupressus funebris.

*Physics*

1. On the apparant size of sun and moon. ( Nature )
2. Characteristics of Photo Flash Lamps.
3. East West Asymmetry of Cosmic radiation at Lahore.
4. Dipole moments of some optically active compounds.
5. On the use of Wilson chamber and the positive excess of mesons in cosmic rays ( Science and Culture )

**GAUHATI.**

1. Economic Geography of Assam.
2. A critical Edition of the Old Assamese Prose translation of the Ramayana.

**MADRAS.****Economics.***Work Published.*

1. Regional Planning in India.
2. India in a World Trading System.
3. Indian Economy under the British.
4. The Location of Key Industries in India.



5. Economic Disintegration in India.
6. India and Pakistan—Economic Potentialities.
7. Economic Implications of the Partition.
8. Some Aspects of the Indian Tax Structure.
9. Cheap Money Policy in India.
10. Future of Federal Finance in India.
11. Finance of Indian Planning.
12. Inflationary Movement—Its Control.
13. Decontrol of Food in Madras.
14. Burden of Rural Debt in Madras.
15. Formation of Co-operative Farms.

*Research work being done.*

1. National Budgets in relation to Planning.
2. Finance of the Government of India since 1937.
3. The Problem of Full Employment in India.
4. Agricultural Planning for Madras.
5. Taxation of Income in India with special reference to Madras.
6. Public Utilities in Madras—Water-supply and Electricity.
7. Indian Currency during the war.
8. Agricultural Marketing.
9. Public Finance in India during the war.
10. Dairy Farming in Madras.
11. Joint-stock Banking in India.
12. Co-operative Movement in Madras.
13. Agricultural Economy of Malabar.
14. Industrial Finance in India.
15. Social Security in India.

*Indian History.*

1. Gupta Polity.
2. Kural— Transliteration and Translation.
3. South Indian Polity through the ages.
4. South India and Ceylon from early times to end of Vijayanagar.
5. The Architectural development of South India.

**Politics and Public Administration**

1. "Organisation and Methods" branch of Government activity with special reference to India.

2. District Boards in Madras 1895-1945.
3. Judicial Administration in the Madras Presidency in the nineteenth century.
4. City Improvement Trusts in India.

### **Geography.**

#### *Work Completed.*

1. "A National Scheme of Power Development in India".
2. "Geography- The Foundations of History".
3. "The Indian Coal Industry-Some Problems".

#### *Work in hand.*

1. "Wheat in India."
2. "The Land of South India."
3. A Study of the Economic Geography of the Mica Industry in India.
4. Cement Industry in India.
5. The Agricultural Geography of South India.

### *Philosophy*

1. The Philosophy of Advaita according to Suresvara.
2. An Examination of the criticisms against the doctrine of Maya.
3. Saiva-siddhanta as expounded in the Sivajnana siddiyar and its six commentaries.
4. The Mystic Philosophy of Saint Ramalingam.

### *Psychology*

1. Language Development (Tamil) in children between the ages 7 and 12 (completed).
2. Studies in Abnormal Psychology (almost completed).
3. Projective studies in personality (completed).
4. Mental Hygiene with reference to school children (in progress)
5. Psycho-analytical study of Wit and Humour in Malayalam literature (in progress).
6. Statistical survey of Arithmetical ability in Madras school children (completed).
7. Studies on Jung (completed).



*Mathematics*

1. Foundations of Projective Geometry.
2. Tensor Calculus.
3. Algebraic Geometry.
4. The Theory of the Distributive Lattice.
5. Topology.

**Statistics***Papers Completed*

1. Co-operative Movement in Indian States
2. Agricultural Labour in India.
3. Indian Census.
4. A Note on the location of Industries in India.

*Work in progress*

1. Analysis of Time-series with reference to cyclical variations.
2. Testing of hypothesis.
3. Current economic problems involving statistical analysis.

*Biochemistry*

1. The chemical constitution of shark-ray collagen.
2. Large scale preparation of amino-acids from slaughter house waste: Preparation of tryptophane from blood fibrin and its estimation.
3. Protein and other nitrogenous constituents in oil seeds,
  - (a). Castor seeds (*Ricinus communis*).
  - (b) *Pongamea glabra* (Karanje oil seeds).
  - (c) Gingilly seeds (*Sesamum indicum*) with special reference to its arginine content.
4. Nutritional aspects of blood regeneration: effect of iso-leucine.
5. Kidney proteins in hypertension: Preparation and physiological action of renin.
6. Fat metabolism: Lipotropic action of (a) choline (b) methionine (c) Proteins.
7. Chemical and microbiological determination of choline in Indian food-stuffs.

8. Microbial enzymes: Glucose oxidase in *Aspergillus niger*
9. Preparation of hexokinase from animal tissues: Study of activity in phosphorylation of glucose and its inhibition by hormones.
10. Utilization of liver residues from shark liver oil for the preparation of antianaemic principles.

### Zoology

1. Copepods parasitics on Madras Fishes.
2. Isopod parasites.
3. Anatomy and life-history of a few Acantho Cshala.
4. The biology of Ptychodera Plana
5. The foraminifera of Madras coast.
6. The digestive system of some fishes.
7. The feeding habits of a few common fishes of Madras.
8. The biology of the edible crab.
9. The copepods of Madras plankton.
10. The nephridia of some tube dwelling and estuarine polychaets.
11. The microfauna of the sandy beach.
12. The Amphipods of the Madras coast.
13. Study of fish eggs and larvae of the Madras plankton.
14. The biology of prawns (*Penacus indicus* and *P. carrinatus* and *metapenaum monocros*).

### Botany

1. Physiology of Parasitism - with special reference to soil conditions and the production of wilt diseases in plants.
2. Survery of hosts and carrier insects in Plant Viruses with special reference to South Indian Virus diseases of economic crops.
3. Study of the Marine Algae of South Indian Coast.
4. Study of Fresh water Algae of South India.
5. Inorganic nutrition of Hybrids of Okra and Brinjal with special reference to healthy and virus-infected plants.
6. Insect and Fungal infections of some Millets and study of the resistant varieties of the latter.



*Technology*

1. Fluidisation of granular solids.
2. The Kinetics of absorption of Co<sub>2</sub> gas by alkaline solutions.
3. Sedimentation analyses with the use of the super Centrifuge.
4. Studies in the Dehydration of castor oil.
5. Solid phase reactions at high temperatures.

*Sanskrit*

1. History of Vedic Literature, including its religion, philosophy and Culture.
2. A History of Classical Sanskrit Literature.
3. Translation with explanatory notes of the Sangitaratnakara of Sangadeva with an historical account of the development of Indian Music and literature relating to music in Sanskrit.
4. Edition of Maharana Kumbha's Sangitaraja.
5. Studies on many works on Vedic exegesis, relating to metre etc.
6. Study on Bharata's Rasa system and Aristotle's Poetics.
7. Edition of the historical poem Anandaranga Champu with a critical introduction and notes ( the subject of the poem is Anandarangam Pillai, dubash of Dupleix ).
8. Amaramandana with critical Introduction etc.
9. Editions of :
  - ( i ) N.rsimhasarvasva,
  - ( ii ) Kavindrakalpadruma.
  - ( iii ) Dara Shuke's Majena ul Maharan,
  - ( iv ) Akbar Sha's Srangar Manjari.
10. Studies in Bharata's Natyasastra and Poetics in general.

*Anthropology*

1. Kerala, Past and Present - The Prehistoric Archeology of Kerala.
2. The Coorg Tribes and Castes. ( Published ).

**Tamil.***Works Completed.*

1. Names and their Significance—A study of Tamil Linguistics.
2. The Place names of the Tamil Country.

3. Comparative Vocabulary of the Dravidian Cognates.
4. Tamil—Literary and Colloquial.

*Works in Progress.*

1. Contribution of European Scholars to the Tamil Language and Literature by Fr. Beschi (Veeramamunivar) and Dr. G. U. Pope.

**Telugu.**

*Subjects Prepared.*

1. A Study and Analysis of the Telugu Language of the Inscriptions of the first Millennium A. D.
2. A Short History of Udasharana Literature in Telugu.
3. Lives of Telugu Poets from 1000-1350 A. D.

*Subjects under Preparation.*

1. A Comparative Study of the Root Material in Telugu.
2. A Study and Analysis of the Language of the Inscriptional and Literary Works of the first Quarter of the 2nd Millennium A. D.
3. Yerrapragada - His Place in Telugu Literature.
4. Lives of Telugu Poets from 1350-1500 A. D.
5. History of Dvipada Kavyas in Telugu Literature.

**Malayalam.**

*Work Completed*

1. Translation of Kerala Pazhama—A contemporary record in Malayalam of the Portugese regime in Malabar (15th century).

*Works in Progress.*

1. Nayars and their Institutions.
2. Snake Cult in Malabar.
3. Folk Art and Literature in Kerala.
4. "Malayalam Metres".

**Kannada.**

1. Desi Element in Kannada.



2. Rukmangada Charita (Champu) of Chikkupadhyaya ( a hitherto unpublished work).
3. Mangabhidhana by Abhinava Mangaraja.
4. Haridasa Sahitya.
5. Yakshagana Sahitya in Kannada.
6. Mackenzie Collections (Kannada).

*Arabic, Persian & Urdu.*

1. 'History of Islam in South India'.
2. Tarik-i Shah Jahan.
3. Waqai-i Saltanat-i Muhammad Shah.
4. Dalilush-Shura by Mohammad Mahdi Wasi Madrasi.

*Indian Music.*

1. Sacred music - its origin and development.
2. Instruments used as accompaniments in Ancient and Medieval times.
3. Raga and Rasa.
4. The history of musical forms used in dance concerts.
5. The influence of Indian Music on the music of the adjacent lands.
6. The musical aspect of the Dance-dramas of South India.
7. Musical iconography.
8. Folk music of the Andhra Desa.

The work "Dictionary of South Indian Music and Musicians" is nearing completion.

**MYSORE.**

*Medical College*

1. A case of unusual blood supply to the mammary gland.
2. Protein deficiency syndrome in South India.
3. Investigation of Infantile hepatic Cirrhosis under the I. R. F. A. scheme.

**INTERMEDIATE COLLEGE, SHIMOGA.**

1. "The Universal Religion"

**CENTRAL COLLEGE, BANGALORE**

*Physics*

1. Cosmic radiation - Photographic studies.



2. Magnetic properties of materials.
3. Spectroscopy.

#### *Chemistry*

1. Adsorption studies with Cupric hydroxide.
2. Ageing of hydrous oxides.

#### *Mathematics*

1. Theory of elementary particles.
2. Fluid Dynamics - viscous and compressible fluids ( theoretical work. )

#### *Geology*

1. Physical, Chemical and Optical study of the amphiboles and Pyroxenes occurring in Mysore Rocks.
2. Micropalaetological study of the Cretaceous and Eocene rocks of India.

#### *Botany*

1. Embryological work on members of
  - (a) Melastomaceae
  - (b) Bignonia
  - (c) Combretaceae
  - (d) Olacales
  - (e) Podostemaceae
2. Study of Parasitic Plants of South India and their anatomy.

#### *Zoology*

1. Cytology of the Protoza, Amphibia and Arachinda.
2. Embryology of Chiroptera.
3. Anatomy of Amphibia and Reptiles.

### **MAHARAJA'S COLLEGE, MYSORE**

#### *Sanskrit*

1. Rigvedic Legends through the Ages.

#### *Urdu*

1. An edition of the Dreams of Tippu, with an English translation and Introduction.



2. Hali as a prose-writer.
3. Development of Biography in Urdu.
4. Urdu Ghazal after World War I.
5. Sharar as a novelist.

### *Philosophy*

1. A major work entitled "Brahma Mimamsa" ready for the press.
2. Types of personality according to Indian Thought ( ready for publication )
3. (a) Value and Objective Immortality.  
(b) Philosophy and Science.
4. The Conception of value in Buddhism, Jainism and Contemporary Philosophy.
5. "Women and Modern Society."  
( An examination of the alleged inferiority of Women ).
6. "Philosophy of Beauty and examination of Principles of Literary Criticism."
7. "Philosophy of Revolution."  
( A contribution to a theory of Social History ).
8. "The Meaning of Society."  
( An interpretation and criticism of theories of Society. )
9. "The Hindu Orientation to Society and Social Obligation"  
( A study of the Social Philosophy of Aryavart. )

### *Psychology*

1. Learning of White rats.
2. Growth of Intelligence of the Pre-School Child.
3. An Investigation into the Causation of Error.
4. An Experimental Study of Group and individual differences in the Aesthetic Appreciation of facial Beauty.
5. Resemblances and differences in the mental Development of Twins.
6. A Study of Emotional life of Children with special reference to fear, anger and laughter.
7. Psycho-galvanic reflex and its application to Crime detection.
8. Vocational Guidance with special reference to the aptitudes for humanistic and scientific studies.
9. An investigation into the individual differences in temperament.

10. An Experimental Study of Manual Dexterity with special reference to Manual dexterity factor.
11. Psychological approach to the Problem of Values.
12. Motivation in Learning.
13. Performance Tests of Intelligence.
14. Tests of Personality Diagnosis.
15. Precognition and Ultra-cognition.

## NAGPUR

### SHRI SHIVAJI ARTS COLLEGE, AMRAOTI

1. Psycho-Physical Parallelism from the point of view of both European and Indian thought on this subject.
2. Work on PURVA MIMAMSA (Mimamsa).
3. Funeral ceremonies in various societies.
4. 'Agricultural Indebtedness in Central Provinces.'

### VIDABRHI MAHAVIDYALAYA, AMRAOTI

Studies in ancient Indian history and numismatics.

1. The seers of Modern India and the implications of their vision and teaching for the direction of the new vitalistic and Psychological Schools of thought.
2. A Collated and critical Edition of Bhaskar's Shishupalavadha with notes and introduction.
3. A critical history of the science of Poetries in Marathi Literature.
4. An investigation of principles of poetry underlying the work of the Chief Poets in Maharashtra from Ramdas to Ram Joshi.
5. A Collated and critical edition of the VirataParva by Mukteshwara with introduction and notes.
6. 'Amateur Economic Surveyors at Madhan' A report on the Survey work done there is under print and will be soon published.
7. 'Rural Co-operative Credit Societies at work in the C. P. and Berar.'

### NATIONAL COLLEGE, NAGPUR

1. Yoga and modern Psychology,
2. Science and Religion: A Synthesis.



3. The nature of mysticism in modern Marathi Poetry.
4. Poetic Signification of Bhagvadgita.

### LAXMINARAYAN ISNTITUTE OF TECHNOLOGY

1. Examination of some coking coals of the C. P.
2. The Temperature Dependence of Viscosities of Liquids and Activation energy.
3. Determination of Molecular Weights from the Activation Energy for Viscous Flow of Liquids.
4. On the Frequency Factor in the Viscosity Temperature Relationship of Liquids.
5. Patent application. Improvements in or Relating to the Activation of Bauxite for Bleaching Purposes.
6. A Study of some of the Factors influencing Alkali Refining of Groundnut Oil.
7. Quantitative Estimation of Titanium by Spectrographic Methods.
8. Evaluation of Definite Integrals by Gauss's Formula in Chemical Engineering Calculations.
9. Rapid Alkalimetric Determination of Magnesium in Carbonate Ores of Calcium and Magnesium.
10. On the Determination of Distribution of Particle Size by manometric Methods.
11. On the Mechanism of Viscosity of Liquids.
12. The Estimation of Gallic and Tannic Acids in a Mixture of their substances.
13. The Non-fatty constituents of Mehua Oil Cake.
14. Estimating Sulphur Dioxide in Furnace Gases using Permanganate in Reich's Test.
15. Factors influencing autoxidative rancidity of Vegetable Fats.
16. Condensation and Polimerisation of Shellac and Cashew Nut Shell Liquid.
17. Stability of Iron Tannic Acid Solution.
18. Studies in Chromatographic Absorption.
19. Studies of some Factors affecting the Refractoriness of some C.P. Minerals.
20. Studies in Lake Pigments:- The Syntheses of Oil Insoluble Colours.
21. Dehydration of Castor Oil.

22. Electro Deposition of Manganese.
23. Quantitative estimation of Mineral Constituents by Spectrographic Methods.
24. Studies in Edgewise Filtration.
25. Comparative Study of the Methods of Particle Size Determination.
26. Estimation of Tannic and Gallic acids in Natural Tanning Materials.
27. Study of Poloregraphic Analysis as applied to Higher Concentration.
28. Emulsion Paints;— A study of the influence of different factors on the properties of oil in water emulsion paints.
29. Studies in the Chlorination of Oils.
30. Wrinkle Effects:— Factors influenceing the formation of wrinkles in varnish and enamels film.

### NAGPUR MAHAVIDYALAYA, NAGPUR

1. The Novels of E. M. Forester.
2. Epistemology.
3. Philosophy of Religion.
4. Educational Psychology.
5. Edition of Prakrit and Apabhramsa Texts:
6. Study of Linguistic Historical and Philosophical problems in Jain Litt.
7. Some peculiarties of the Sanskrit Drama
8. Edition of Vachha Haran.
9. Mahanubhao Philosophy.
10. Cultural contact between English and Marathi Litt.
11. Provincial Finance in C.P. since the reforms of 1919.
12. Natia Shairi in Urdu.
13. A play in Urdu depicting the Philosophy of Iqbal.
14. Women Novelists of the 19th Century.
15. Cotton marketting in C. P. & Berar its organisation and future development.
16. Anti-Facist elements in Tagore.
17. The working of the Provincial Autonomy in C. P. & Berar.
18. Studies in Marathi Literature.
19. Abul Fazl and his times (16th and 17th Centuries).



20. Philosophic Attitude.
21. Fact and Belief.
22. Study in Paninian System of Grammar.
23. Development of Hindu criticism.
24. Development of Krishna Kavya in Hindi Literature.
26. Influence of Shelley on the early Bengali poets.

**G. S. COLLEGE OF SCIENCE & AGRICULTURE  
KHAMGAON (BERAR).**

1. Embryogeny of *Euphorbia hirta*. This is nearing completion. Further, it is contemplated to under-take research work on the Cytology and Embryology of Angiosperms with special reference to crop plants.

**BIO-CHEMISTRY, NAGPUR UNIVERSITY**

1. Effect of intermediary fat metabolites on the potency of endogenous insulin.
2. Disturbance of hepatic glycogenesis and glycogenolysis by certain compounds and their restoration.
3. Studies on the aetiological factors responsible for the onset of diabetic symptoms.
4. Effect of certain chemicals, drugs and hormones on the degree of ketolysis in vitro.
5. Faulty diet leading to hypercholesterolemia and associated troubles.
6. Studies on the constitution of amellin.
7. Effect of toxic metabolites on some of the vitamin contents of blood and tissues.
8. Influence of different hormones and other factors on the nutritive value of food stuffs.
9. Studies on some naturally occurring sterols and sterol-reactions.
10. Bactereostatic action of amellin.
11. Studies on the activation and inactivation of enzymes.

*Political Science*

1. Social and Political Thought in Maharashtra (1857-1920)
2. Political thought and theories in the Mahabharat.
3. Regionalism in Indian Politics.

4. Social and Political thought of Dayanand.
5. The Role of the State in the organisation of socio-political Life (1818-1935) in India.
6. Nationalism and Communalism in Indian Politics (1857-1945).
7. Political and Social thought of Tilak.
8. Political and Economic thought of Ranade.
9. Growth of Political Parties in India.

### **UNIVERSITY TRAINING COLLEGE, NAGPORE**

1. A study of the Scholastic interests and attitudes of adolescent Girls.
2. Investigation into the Civic attitudes and ideals of children between ages 12 and 17.
3. An experimental investigation into the Religious attitudes of School going children:
4. Tukaram as an Educator.
5. Mahatma Gandhi as an Educationist.
6. Sir Syed Ahmed Khan as an Educationist.
7. Investigation into the attitudes of girls towards play.
9. A comparative study of the Social Education of Girls in India and France.
9. The attitude of Normal School Children towards punishment.
10. The Role of Leadership among Middle and High School Boys.
11. Anti-Social Behaviour of High School Children.

### **S. B. CITY COLLEGE, NAGPUR.**

1. Social and Political thought of the saints of Maharashtra from Dynaneshwara to Ramdas with special reference to Ramdas.
2. The role of the State in the Organisation of Socio-Economic Life of India, during 1818-1935.

### **G. S. COLLEGE OF COMMERCE, WARDHA**

**Co-operative Action in the Economic Life of the Aborigines of Dharni Tract.**



## II.

**Completed Research work for Doctorate Degree  
in Arts & Science (1947-48)**

*Arts*

1. Urdu Shairi Tarekhi-Wa Siyasi Pusmanzar Ki Roshri men.
2. A complete literary survey of the life and words of Vidyapati, a Hindi poet, research on his religious faith teachings, exposition of his great merits, comparative superiority over other works-proper valuation of his greatness in Hindi Literature.
3. The currents of languages and dialects of Indo-Aryan Group in Media Section.
4. Gandhism and its influence on Hindi Literature.
5. Modern Hindi Poetry.
6. Nationalism and Communalism in Indian Politics.
7. The Political and Social Ideas of Lokmanya B.G. Tilak.
8. Mobilisation of C.P. and Berar's mineral Industries.
9. A critical study of the agricultural labour conditions in India with special reference to the Central Provinces and Berar.
10. Economic conditions of the Karnatak Province, an economic exposition of a linguistic province as contemplated by the Constituent Assembly.
11. Financing of Agriculture in Berar.
12. Land Tenure and Land-lordism in C.P. and Berar.
13. Agricultural Indebtedness in C.P.—its extent and causes.
14. The Lyrics in Sanskrit Literature.
15. An Investigation into the theory tragedy and a thorough comparative and critical study of the tragadies in Marathi literature.
16. Moulding of Hindu Culture and Civilization by the great Marathi writers (from 12th to 16th Century).
17. Philosophical tendency in Khawaja Hafiz's poetry.
18. The Legacy of Coleridge to Modern Literary Criticism.
19. A Historical Survey of Marathi Prosody and its prospects.
20. Housing Problem for Industrial workers in C.P. and Berar.
21. Women workers in Industries in C.P. with special reference to Textiles or (on one of the aspects-Wages or Efficiency or Health Insurance Act).

22. Social, Political and Economic Ideas of Mahadeo Govind Ranade.
24. Coleridge's Theory of Criticism.

*Science*

1. Embryological studies in Rubiaceae.
2. Embryological Studies in the Leguminosae.
3. Studies in Bacterial Variation.
4. Anatomy, and Development of the genitivation of Local long-horned grasshopper (Tettigonidae).
5. Indian Fossil Plants with Special reference to C. P. Flora.

**OSMANIA.**

*Geology.*

1. Minerals and Rocks of Hyderabad.
2. Earth quake of India and abroad.
3. Properties and uses of precious stones.

*Economics.*

4. Textile Industry in Aurangabad.
5. Textile Industry in Warangal.
6. Silk Industry in Armur.
7. Economic and Social conditions of Railway Workers in Hyderabad.
8. Cigarettes Industry in Hyderabad.
9. Motor Bus Transport in Hyderabad.
10. Indigenous Banking in Hyderabad.

*English.*

11. Symbolism in English Poetry.

*Sanskrit.*

12. New Vedic words. (compilation and philological interpretation of hitherto unnoticed Vedic words occurring in the Mantra portion of the various Sainhitas).
13. Studies in Sanskrit Rhetoric.
14. The concept of Rta in the Rogveda—Sainhita.
15. History and development of Doshas in Sanskrit Rhetoric.



*Sociology.*

16. Mahbubabad ke Lambaron Ki Insaniyati aor Samaji Sarve.
17. Mulug Taluge ke Koyon ki Insaniyati aor Samaji Sarve.
18. Bedaron ki Insaniyati aor Samaji Sarve.
19. Zile Adilabad ki Gondon ki Tahzib par Hinduani Asar.
20. Hindustani Musalmanon ke baz Tahzibi aor Samaji Masle.
21. Haederabad men Jarayam ki Samaji Naoiyat.
22. Dakhni Vaishnas Brahmanon ki Samaji aor Tammadduni Zindagi.
23. Haederabad ki baz Hindu Zaton ki Samaji aor Tammadduni Zindagi.
24. Dakhani Musalmanon ke Samaji aor Tammadduni Jayza.
25. Haederabad men Samaj Sudhar ke baz aham Idare aor Tahriken.

*Botany.*

26. Some common Indian Herbs with notes on their anatomical characters.
27. A study of some of the Grasses of H. E. H. the Nizam's Dominions.
28. On the anatomy of some of the convolvulaceae.
29. On the anatomy of some of the Mangroves of the Koringa forest Cocanada.

*Persian.*

30. The Life and Poetry of Nadhiri of Nishapur.
31. Mulla Nuruddin Zhuhuri and his works.
32. Origin of Persian Poetry and its History.
33. Nuquduz Zawahir wa Uqudul-jawalvir of the famous poet of Persian Rasheeduddin Watwat.
34. The Life of Fakhruddin Iraqi and characteristics of his Poetry.
35. The Influence of Persian Language on Urdu Language.

**NIZAM COLLEGE**

36. A Spectroscopy Study of Amethyst quartz.
37. Photo conductivity of Amethyst quartz.
38. Oscillation of liquid column and criteria for stream line motion.

*Law.*

39. Comparative principles of recognition of foreign judgements.



40. Conduct of Muslim State with the Dimmi subjects.
41. The administration of justice in Islam.
42. Hindu widow's right of adoption with reference to property.
43. The importance of custom in Hindu and other legal systems.
44. Principles and precedents of conflict of laws in Hyderabad State.
45. Mutual rights of husband and wife.
46. Marriage and principles of conflict of Laws.
47. English Theory of consideration.
48. Justice and administrative law in England.
49. Conception of crime and punishment.
50. Personal Laws in Hyderabad.
51. Muslim Law of guardianship compared to other systems of Law.
52. Hindu joint families and Roman families.
53. Wills in various systems of Law.

*Mathematics.*

54. "The Theory of Linear Equations in other Quaternionic Field".

*Theology.*

55. "Torts due to negligence (a comparative study of English and Islamic Principles of Law)".
56. "The Economic Doctrines of Islam".

**PATNA.**

*Arts.*

1. Tendencies in the History of the Maithili literature.
2. Mutiny in Bihar and Chotanagpur.
3. Contributions of Bilgrami's to Persian literature.
4. Intricate Foreign Policy of the East India Company.
5. Historical Origins of Buddhist Religions and Philosophy.
6. Psychological investigation of Indian (Hindu) Social customs.

*Science.*

1. Lattin Potentials and Lattin Dynamics.
2. Absorption.
3. Physical Chemistry.



**RAJPUTANA.***Hindi.*

1. "The evolution and the form of Nationalism in the Modern Hindi Literature".
2. "Influence of Sanskrit Literature on Hindi Literature".
3. "Arts & Aesthetics in the Riti Literature of Hindi".

*History.*

4. "Feudalism in Rajasthan".
5. "Mewar in Pre-Mughal India".

*Persian.*

6. "Indian contributions towards Persian Lexicography".

*Zoology.*

7. "Studies on the Minute Anatomy of the Amphibian Heart".

**RANGOON***Burmese*

1. The Development of the Burmese Language during the Period 11th Century to 13th Century A. D.
2. Burmese Buddhism during the period 11th Century to 13th Century.
3. Burmese Chronicles.

*English*

1. "A Burman studies 'Hamlet' "
2. English-Burmese Dictionary.
3. "The Theme of Jealousy in Elizabethan Drama."
4. "The Colour Scheme in Elizabethan Drama."

*Anthropology*

1. "Burmese Folk Tales"
2. "The Pre-Buddhist Religion of the Burmese."

*History*

1. "The Reconquest of India."
2. "A History of Modern Burma since 1752."

3. "Relations between Burma and South India upto the 6th Century A. D."
4. "The First Anglo-Burmese War, 1824-26."
5. "The Political History of Burma before 1044 A. D."
6. "The Second Anglo-Burmese War, 1852."

### *Biology*

1. Problems of Artificial Insemination in Burma.
2. A Survey of Fishes of Burma with special reference to edible fishes.
3. Taxonomic study of the bamboo and fern floras of Burma.
4. Fresh water Algae.
5. Some aspects of the antibiotic effects of hard wood fungi of Burma.
6. Problems in yeast culture in Burma.

## **TRAVANCORE**

### **University College, Trivandrum**

#### *History and Economics*

1. Growth of central and local Governments in Travancore from the earliest times to the present day.
2. Labour conditions in Travancore.

#### *Botany*

1. Pharmacognosy of Ayurvedic Drugs.
2. Genetical studies on Sweet Potato.
3. Genetical studies on Tapioca.

#### *Chemistry*

1. Doing work on the products obtainable from the bark and leaves of *Mangifera indica*-obtained crystalline products from both.
2. Working on the products from the rind of the fruit of *Aegle Marmelos*.
3. Working on the root bark of *Salacia Oblonga*. Crystalline products have been obtained.
4. Working on separation of bye-products in Sodium Chloride industry.



*Physics*

1. Scattering of light in liquids and glasses.
2. Ultrasonic studies in liquids.
3. Atmospheric Electricity.
4. Studies in Viscosity.
5. Field intensity measurements in Trivandrum.

*Zoology*

1. Studies on the reproduction, embryology and larval development of Decapod Crustacea.. (Work on *Caridina* has already been completed.)
2. Studies on the development of Scorpions. (Work on *Palamnaeus* is complete).
3. Studies on other Arachinds.
4. Insect Parasites and Predators.
5. Studies on the taxonomy and cytology of Gall Midges.
6. Cytological studies on hermaphrodite animals.
7. The embryology of Parasitic Isopids.
8. Studies on Crustacean Embryology. (Work on *Palaemon* complete).

**Central Research Institute, Trivandrum***Applied Biology*

1. Survey of the natural enemies of the coconut caterpillar *Nephantis serinopa*, Meyr as observed along the coastal regions of Travancore.
2. Survey of insect pests of sugar-cane in Travancore.
3. Insect pests of the tapioca plant and the jack tree.
4. Insect pests of felled bamboos, with special reference to seasonal variation in starch content, and insect attack.
5. Studies on the rice bug, *Leptocorisa acuta*, var. comprising seasonal incidence, extent of damage caused and alternate host plants.
6. Studies on *Spodoptera mauritia*, Boisd., with special reference to its parasites, and its control by insecticides.
7. General studies on the other important pests of paddy.

8. *Tapioca*:— (*Mamhot Utilissinna*) at the Tapioca Research farm, Trivandrum-Selection of the best from the existing ones. Evolution of new varieties by hybridisation, by chemical treatment. etc. Evolution of Polyploids and Triploids.
9. *Paddy*:— (*Oryza Sativa*) at the paddy Breeding Station, Kayamkulam-Single plant selection of best strains from the locals. Evolution of saline resistant varieties by hybridisation.
10. *Sesamum*:— Selection and artificial production of new varieties.
11. *Plantains & Pine-apples*:— Preliminary studies are being carried out.

### *Applied Chemistry*

#### **A. Chemistry and Technology of Marine Oils**

1. Studies in the Autoxidation of Shark Liver Oil.
2. Anti-oxidants for Shark Liver Oil.
3. Enzymolysis of shark liver oil with vegetable and pancreatic lipases.
4. Application of the *Bellier figure* as an index of adulteration of shark liver oil with groundnut Oil.
5. Deodorisation of shark liver oil by selective hydrogenation.
6. Deodorisation of shark liver oil by agitation with fermenting media.
7. Ethical preparations from shark liver Oil.
8. Studies in the extraction, refining, stabilisation, and storage of thorapeutic shark liver Oil.
9. Disposal of stearine and low grade fish Oils.
10. Chemistry and utilisation of Trutle Oil.
11. Halogenation and mercuration of deoxygenated fish Oils.
12. Chemical and physical characteristics of a wide range of fish fats.

#### **B. Chemistry of Indigenous Drugs.**

1. The alkaloids of *Cyclea burmanni* syn *C peltata*.
2. The alkaloids of *Tiliacora vacemosa*.
3. Alkaloid contents of the Travancore varieties *Datura fastuosa* and *Datura alba*.
4. Chemical examination of *Physalis minima*.
5. Chemical examination of the pods of *Parkia biglandulosa*.



### C. Travancore Forest Products.

1. Clarification and storage of Travancore forest honey.
2. The fixed oils of *Sterculia alata*, *Sterculia nobilis* and *Sterculia foetida*.
3. The resin from *Sterculia Urens*.
4. Essential oils from cloves and nutmeg.
5. Retting of pine-apple leaf fibre.
6. Examination of wood-tar ( byproduct of the FACT producer gas plant. )
7. Tintorial applications of certain indigenous plant pigments.

### D. Fundamental Studies.

1. Synthesis of Aroylated anthocyanidins.
2. Synthesis of substances related to the phytohormones.
3. Synthesis of glycosides.
4. Synthetic experiments in the quinoline, and isoquinoline groups.
5. Stability studies on coconut oil, gingelly oil, and other edible oils.
6. Isolation and characterisation of plant colours.
7. Synthesis of organic compounds of probable insecticidal value.

### E. Mineral Research.

1. Separation of rare-earth constituents from monazite.
2. Synthesis of certain organic compounds of Cerium.
3. Studies on Travancore lignite, peats etc.
4. Calcium oxide content of Travancore lime shells-Experiments to improve the quality of building lime.

### F. Chemistry of Foods.

1. Study of the composition of tapioca tubers of different varieties cultivated under varying conditions in Travancore.
2. Composition of Banana starches.
3. Milk and milk products.

### G. Agricultural Chemistry.

1. Studies on the manurial requirements of Travancore soils.
2. Characteristics of the Alkali soils of South Travancore.
3. Investigations on the nature of the sulphur compounds present

in the *Kari* ( peaty soils of Travancore and the transformations they undergo.

4. Microbiological studies on the Kari ( peaty ) soils.
5. Utilisation of Trichinopoly Phosphatic Nodules.
6. Soil fertility studies of the Rice soil of Kuttanad.
7. Pot Culture studies to investigate the effect of letting in saline water into paddy fields on soils fertility and crop yield.

### H. Water Technology.

1. Geo-chemical studies of surface and ground waters in Travancore.
2. Study of the Pampa River System.
3. Studies in water purification.
4. Disposal of effluents and Industrial wastes.

### I. Miscellaneous Studies.

1. Deacidification of Transformer Oils.
2. Baking enamels from cashew shell fluid.
3. Utilisation of coconut wastes and waste cellulosic materials.
4. Keeping quality of pyrethrum extracts.
5. Utilisation of byproducts from the salt industry.

### *Division of Marine Biology and Fisheries.*

1. Chondreocranium of shark.
2. Life history of *Palemon carcinus*.
3. Chelifera of the Vembanad lake.
4. Bionomics and Distribution of the lime shells of Travancore.
5. Crab fauna of Travancore and the adjoining coast.
6. Bottom fauna of the Travancore coast.
7. Taxonomy and distribution of Cumaceans.
8. Life History of Caligus.
9. Bionomics and life history of *Etroplus Suretensis*.
10. Seasonal distribution of copepod plankton of the Trivandrum coast.
11. Anatomy of *Wallagonia attu*.
12. Parasite of commercial food fishes.
13. Taxonomy and Seasonal distribution of Diatoms of the Travancore coast.



14. Studies on the embryology of *Macropodus Cupanus*.
15. Bottum fauna of ponds of Travancore.
16. Bottum fauna of the Kayamkulam lake.
17. Studies of the life history of insects and mites infecting dried fish.
18. Foraminifera of Travancore.

### Division of Preventive Medicine

#### 1. *Bacteriological.*

- (a) Bacteriology of enteric fevers.
- (b) Incidence of Typhus in the State.
- (c) Weil Felix reaction in different conditions such as Virus infection, Cancer, Pregnancy etc.
- (d) Non-lactose fermenters in Stools.
- (e) Pathogenic Bacteria in urine.
- (f) Study of Cholera strains.

#### 2. *Haemetological.*

- (a) Study of Tropical Eosinophilia.
- (b) Study of blood groups of Communities.

#### 3. *Parasitological.*

- (a) Hookworm Survey of Travancore.
- (b) Haemoglobin and blood cell variations in hookworm infection.
- (c) Prevalence of intestinal protozoal infection in Travancore.
- (d) Entomological aspects of Filariasis in Cochin.

#### 4. *Treatment of Cirrhosis of the Liver.*

( in collaboration with the Indian Institute of Science, Bangalore ).

#### 5. *Nutrition.*

- (a) Diet & Deficiency disease surveys.
- (b) Comparative merits of full cream milk and separated milk powders.
- (c) Yeast as a supplementary food.

### **Division of Statistics**

1. On the exact distribution of S. S. Wilks' Test Criteria,  $L_{mvc}$  and  $L_{vc}$  relating to Multivariate normal population.
2. On the distribution of certain statistics relating to problems in ordered samples.
3. On a class of integrals of the type arising in Statistical investigations.
4. On the family Budgets of the paid Government servants in Trivandrum.
5. Statistical analysis of the data relating to trade in Cashewnuts in Travancore.
6. Estimation of the acreage and production of coconut in Trivandrum Taluk.
7. Coir survey.
8. The relation between shape of the grid and estimate of the yield in crop cutting surveys.

### **COLLEGE OF ENGINEERING, TRIVANDRUM**

1. Testing of materials.
2. Testing of Timber.
3. Dimensional Analysis.
4. Pole Face Losses due to open slots.
5. Capacitor Motor.
6. Confluence of Channels.

### **SANATAN DHARMA COLLEGE, ALLEPPEY**

1. General Survey of the Gastropod Molluses in Travancore Back waters.
  2. Anatomy of "Telescopium Sp." (Gastropod).
  3. Biology of Fresh Water Insects with special reference to their ecology.
  4. Studies in the fresh water Algae of the Alleppey coast and suburbs.
  5. Studies in the ecological anatomy of some families of Angiosperms in Alleppey and Suburbs.
  6. Preliminary studies on the Cytology of some back-water plants.
  7. Studies in the fresh water algae of Alleppey and suburbs.
-



## UTKAL

### RAVENSHAW COLLEGE, CUTTACK.

#### *History*

1. A Survey of Orissa History.
2. A study of Orissa during the early British rule.

#### *Economics*

1. A study of Federal Finance with special reference to the New Constitution of India.

#### *Mathematics*

1. Fourier Series:
2. Derangement of Infinite Series and Products.

#### *Oriya*

1. Preparation of "RUDRA SUDHA NIDHI" the First Oriya Prose work, the 13th Century, with notes and introduction.
2. Work in Sanskrit for the publication of "ABHINABA GEETA GOBIND" the rival work of "GEETA GOBIND" by Gajapati King Purusottam Dev of Orissa.

#### *Sanskrit*

1. Work in "Pali Buddhism."
2. Sanskrit and Oriya translations of the first half of the Dharma-pada, a work belonging to the Pali Canon.
3. Study of Tantra Literature.

#### *Psychology and Philosophy*

1. Completed a work in Theoretical Psychology.

#### *Education*

1. "Emotional Reaction in the Child."
2. "Preliminary Investigation into the study of Tension."

#### *Physics*

1. X-Ray — Fibre Problems.
2. X-Ray — Energy Spectrum of fundamental particles from De Broglie's waves ( A new technique to be developed. )

3. 'Molecular Physics' 'study of ring Phenomenon.'
4. 'Band spectra' 'Resonance in excitation of molecules' ( in progress. )

### *Chemistry*

1. Decolonisation of Punning oil.
2. Organic Mercury Compounds.
3. Incomplete dissociation of strong Electrolytes.
4. Apparent Molal Volume of Electrolytes.
5. Glass electrodes.
6. Diffusion Potential.

### *Botany*

1. 'The role of micro elements viz., Mn., Zn., B and Cu. on the nutrition of Rice plants.'
2. 'The rooting of horticultural plants'.
3. 'Effect of calcium on the growth of roots in Rice Plants and its possible effect on the root cells.'

### *Physiology*

1. Haematological study of normal organs.
2. Effect of Vitamins on endocrines on sugar utilisation in the tissues.

## **BHANDARKAR ORIENTAL RESEARCH INSTITUTE POONA 4**

1. Critical Edition of the Mahabharata.
2. Epic Studies.
3. Revision of the "Vedic Index"
4. Vedic Bibliography.
5. Bibliography of Epic Studies.
6. Cultural Index of the Puranas.
7. Monograph on Miscellaneous topics relating to Indian history and Cultural history.

## **BOSE RESEARCH INSTITUTE, CALCUTTA.**

### *Physics*

#### **(a) Nuclear Physics.**

1. Neutron generator.



2. High voltage electrostatic generator.
3. Transuranic elements.
4. Photographic emulsion method and Wilson chamber method for the study of nuclear fission.
5. Cosmic rays - Wilson chamber; small and large ionization chamber;
6. Micro radio waves : Extension of Sir J. C. Bose's investigations.
7. Ultrasonic wave generator.

(b) *Biophysics,*

1. Bioelectric potentials.
2. Membrane potential.
3. X-ray investigations on large molecules of biological importance.

*Chemistry*

1. Biochemistry — Isolation and chemical structure determination of irritability substance in *Mimosa pudica*.

*Plant Physiology*

1. Chemical mediator in the transmission of excitation in *Mimosa*,
2. Control of water hyacinth by auxin treatment.
3. Influence of auxin on the bud development and fruit setting in Mulberry cuttings,
4. Investigations on cinchona - Growth studies, nutrient experiments.
5. Breaking the dormancy of potato tubers.
6. Storage of vegetable seeds.

*Plant Breeding and Cytogenetics*

1. Breeding investigations in long staple cotton.
2. X ray irradiation of jute.

*Microbiology*

1. Fibre retting substances.
2. Antibiotic substances.

*Anthropology*

1. Blood grouping investigation.
2. Frequency of plural and multiple birth in India.

## H. B. TECHNOLOGICAL INSTITUTE, U. P., KANPUR

### *Oil Section*

1. A study of the physical and chemical characteristics of some Indian Petrols and of petrol power-alcohol blends made with them.
2. Examination of ghee and detection of its adulteration by ultra violet light.
3. Hydraulic Brake fluid.
4. Laboratory Experiments on the extraction of castor seed and cake with industrial alcohol.
5. Mustard oil and Beri-Beri.
6. Kinetics of saponification of Mahua oil.
7. Development of desired odour and flavour in mustard oil expressed by means of expellers.
8. A study of mustard seed and oils of U. P.
9. A study of the viscosity characteristics of blends of Blown rape oil with mineral oil.
10. Nigeshwar Oil.
11. Solidified Fuel.
12. High Temp. Graphite Lubricant, a substitute of "Oil Dag."
13. Studies in the inhibition of the oxidation of linseed oil.
14. Phosphatide of vegetable lecithin from castor oil.
15. Hydraulic brake fluid.
16. Vegetable oil Lubricants.
17. Manufacture of Mustard, a substitute of Colemans Mustard from indigenous materials.
18. Vegetable oils as illuminants.
19. Preparation of Driving Journal Compound.
20. Direct method of determining the solubility of soap.
21. Preparation of cutting compounds.
22. Detection of Argemone oil in mustard oil.
23. Comparative study of susceptibility to rancidity of oils, Ghee and Hydrogenated fat.
24. A study of the method for determination of melting point of fat.
25. Hardened gum from Rosin.
26. Study of different varieties of mustard with a view to detect adulteration.



27. Replacement of glycerine by a cheaper substitute in the Reichert, M. Value determination of oils and fats.
28. Utilisation of groundnut and cottonseed husk for the preparation of plasters.
29. Study of the gum-oleo-resin *Boswallia Sarrata* and suggest a method for the separation for its constituents.
30. Uses of castor and Mahua cake in the preparation of plastics.
31. A study of the process of alkali refining of oils, groundnut and til oil.
32. A study of the characteristics and composition of the various brands of Indian Hydrogenated fats.
33. Vegetable oils as substituted for mineral quenching oils,
34. Refining of Nageshwar oil and a study of its colouring matter.
35. Note on the preparation of vegetable casein from vegetable cakes.
36. Experiments on the preparation of oil cloths.
37. Preparation of sticking plaster or emplaster-resinee from the indigenous materials.
38. Fat splitting by castor seed lipase.
39. Preparation of Anti gas cloth.
40. Improved Wardha Oil Kohlu.
41. Keeping qualities of vegetable oils.
42. A study of the method of detection of castor seed in feeding cakes.
43. Formation of cheap and attractive finishes for wooden toys.
44. Lacquer for food tin-containers.
45. Factice ( Rubber substitute ) from castor oil.
46. Preparation of diaphragm for forced feed fuel pump.
47. Production of oleic acid from Indian Vegetable oils.
48. Factice Distillate from castor oil.
49. Polymerised products from castor oil.
50. Application of Dehydrated castor oil in paints and varnishes.
51. A new process for the extraction of castor seed or cake with industrial alcohol.
52. Preparation of Dehydrated castor oil.
53. Manufacture of stand oil.
54. Blown Rape seed oil.
55. Regeneration of the spent Nickel catalyst obtained in the hydrogenation of oils.

56. The preparation of factice by vulcanisation of oils.
57. Preparation of insulating cloth, a substitute for imported "Empire cloth" for electrical insulation.
58. Examination of a sample of tung seed grown in India.
59. Examination of Rohini seed and its oil.
60. A study of antioxidants for edible oils.
61. Preparation of Diaphragm cloth for petrol alcohol blends.
62. Plastics from castor and mahuwa cakes.
63. Plastics from groundnut and cotton seed husk.
64. Examination and study of various oilcakes produced in the Province.
65. High temperature graphite lubricants.
66. Preparation of oil cloth.
67. Utilisation of chimney soot.

#### *General Research Section*

1. Preparation of :-  
Silver Proteniates. (1) Argyrol. (2) Protargol.
2. Dermatol.
3. Manufacture of Amyl Nitrite.
4. Calcium gluconate by electrolytic oxidation of glucose.
5. Preparation of dicalcium phosphate.
6. Preparation of dimethyl glyoxine.
7. Preparation of boric acid.
8. Preparation of chloral hydrate.
9. Preparation of monochlorobenzene.
10. Preparation of Sodium tauroglycocholate.
11. Preparation of D. D. T.
12. Preparation of gammexane.
13. Preparation of cadmium sulphide and silver nitrate.
14. Preparation of citric acid.
15. Preparation of sodium Thiosulphate.
16. Preparation of merchromer.
17. Preparation of Indian Ink and other water proof inks.
18. Chromium Plating.
19. Anodic oxidation and colouring of aluminium and aluminium alloys and articles.
20. Electroplating of non metallic articles.



21. Preparation of Liquid Gold.
22. Manufacturing Glue.
23. Caoutchoucene from waste vulcanised rubber.
24. Kaccha Pucca House and building plasters.
25. Utilisation of aluminium scraps.
26. Charcoal briquettes.
27. Utilization of mango kernels as animal food.
28. Study of Cellulosic materials for Rayon Industry.
29. Induline and nigrosine dyes.
30. Preparation of Recinoleic acid and its derivatives.
31. Essential oils from malta orange skins.
32. Production of butter and ghee flavour.
33. Industrial utilization of bones for the preparation of arthophosphoric acid and super phosphates.
34. Utilisation of Reh soil for the manufacture of soda-ash and caustic-soda.
35. Preparation of metal powders.
36. Preparation of lactose from skimmed milk.
37. Colouring of aluminium powder.
38. Preparation of potassium salts from nitre.
39. Activation of earths for bleaching purposes.
40. Preparation of sachhar-ine and ethyl chloride etc.
41. Resinification of tannins.
42. Preparation of photographic plates.
43. Preparation of photographic gelatin.
44. Preparation of acetic anyhydride.
45. Study of Gulmehdi seeds.
46. Study of lanolin from woolen mills.
47. Preparation of synthetic perfumes.
48. Preparation of lactic acid by chemical method from sugar and molasses.
49. Study of vegetable tanning materials from the barks of some forest trees.
50. Cultivation of ocimum plants and study of its chemical constitutions and recovery of camphor.
51. Soluble sugars from cellulosic materials.
52. Studies in the manufacture of cellulosic acetate cellulosic butyrate and viscose etc.

53. Fibre Scheme.
54. Hand made Paper Scheme.
55. Kaccha Pacca House.
56. Essential Oil Scheme.
57. Reh Scheme.

## Indian Agricultural Research Institute, New Delhi.

### I. AGRONOMY

#### 1. *Soil Fertility Problems.*

##### (a) *Manurial Experiments.*

(i) *Nitrogenous manures and fertilizers*:—Experiments are in progress to test the relative values of nitrogen in different organic manures and inorganic fertilizers and also responses of their combinations on wheat and maize. The organic manures include F. Y. M. compost oil cake.

(ii) *Phosphatic fertilizers*:—Different forms of phosphatic fertilizers (superphosphate, bonemeal, basic slag) are being tested to study their response on *kharif* and *rabi* legumes in cowpeas, soyabeans berseem, senji etc. and after effects on cereals following the legumes.

(iii) *Nitrogenous, phosphatic, potassium and calcium fertilizers*:—An experiment is in progress to study the effect of ammonium sulphate, superphosphate, sulphate of potash and lime, each at three levels in all possible combinations on the yield of wheat.

(iv) *Green manures*:—Different legumes (sanhemp, cowpeas, guar) have been included in an experiment to study their relative values as green manures singly and in combination with artificial fertilizers on wheat. Experiments are also in progress to study the effect of green manuring when that crop is grown *in situ* and brought from outside.

##### (b) *Placement of fertilizer.*

To effect economy in the quantity of fertilizers used and their better utilization by field crops, the method of applying the fertilizers by drilling is being tested against the usual practice of broadcasting.

##### (c) *Mixed cropping.*

The possibilities of maintaining soil fertility by growing a mixture of cereals and legumes under different fertilizer treatments are being investigated.



(d) *Mixed farming and rotation experiments on small holdings.*

The objective of these experiments is to obtain maximum overall yields which a cultivator is likely to get from holdings of 6 acres under irrigated and unirrigated conditions designed to meet the requirements of his family members and cattle. The relative merits of different rotations, incorporating legumes manured with phosphates are being tested with cultivators cropping system as the control.

2. *Irrigation experiments.*

The possibilities of utilizing the surplus river water during the monsoon for growing the *rabi* crops without further irrigation have been investigated.

3. *Cultural experiments.*

The effects of spacing cultural operations, seed rates, time of sowing on the yield of different crops like sugarcane, gram, peas, potatoes are being studied.

4. *Varietal yield trials.*

Yield trials with improved varieties of different crops are in progress. The new varieties of Co. canes bred at Coimbatore are tested to find out their suitability under climatic and soil conditions prevailing in this tract.

5. *Agrostology.*

This section has been newly established. Work is in progress. (i) to produce high yielding and palatable fodder grasses and legumes for cattle, (ii) to increase the productivity of the natural grasslands (iii) to provide suitable seed mixtures of grasses and legumes for maximum fodder production and building up soil fertility for the subsequent food and cash crops and (iv) to collect seeds of grasses and legumes from different parts of India and abroad for the above mentioned work.

## II CATTLE BREEDING (SAHIWAL HERD)

The programme of work under this herd is as follows.—

1. Line breeding and selection for the improvement of milk yield.
2. Handling of the stock for the development of milk temperament.
3. Feeding of stock on balanced rations for growth, early maturity and high milk production.

4. Four times milking as a means of stimulation of high milk yield.
5. Pre-milking as a means of stimulation for milk production, to train heifers to milk before calving and to prevent under trouble.
6. Early maturity treatment to prove milk capacity of heifers before four years of age and to test bulls for transmitting capacity of high milk yield before the age of five years.
7. Calf rearing on standardised milk ration (containing 3.5 per cent butter fat), based on a scale of one-tenth of birth weight for an even growth and as a measure of control against scorching in calves.

### III AGRICULTURAL SUB-STATION, KARNAL

Large scale field experiments are in progress at the substation on the lines mentioned above under Agronomy. Paddy is one of the main kharif crops on which the various experiments are being conducted. Work on wheat on lines of that in Delhi is also conducted. The work on cattle breeding and cattle management is also in progress on the Tharparkar herd.

#### BOTANY

##### *Research problems completed in 1948*

1. Genetics of sex in Luffa.
2. Inheritance studies in gram mutations.
3. Natural crosspollination in wheat.

##### **Work still in progress in 1948.**

1. Survey of Indian wheats.
2. Description and registration of commercially important varieties of wheat and those of special interest for plant breeders.
3. Co-operative experiment for studying the influence of environment on the qualitative and quantitative characters of wheat.
4. Performance tests of New Pusa wheats in different Provinces of India
5. Study of exotics and Indian hybrid wheats.
6. Trials of wheat at different levels of fertility.
7. Study of vernalisation response of wheat collections.
8. Breeding for rust-resistance and yield in wheat and linseed.



9. Breeding for wilt-resistance in Arhar.
10. Breeding in cross pollinated crops such as Brassica and Maize.
11. Breeding of superior potato varieties for the plains.
12. Breeding of *N. rustica* for higher nicotine content.
13. Classification of varieties of *Hibiscus esculentus* and related wild species with reference to their usefulness for plant breeding.
14. Breeding early ripening tomatoes with higher vitamin content and improved flavour by utilising the wild tomato *L. pimpinellifolium*.
15. Investigations on the utilisation of wild relatives of crop plants in breeding.
16. Survey, collection and utilisation of indigenous plant material in the improvement of Indian crops.
17. Importation and study of foreign plant material with a view to adding to the existing collection of useful plants of the country.
18. Investigations on the sterility of interspecific crosses in *Linum*.

#### *Cytogenetics*

1. Cytological studies in the tetraploids of *Eruca sativa*.
2. Cytological investigations in some autotetraploids-chilli, gram, *sesamums*.
3. Cytogenetical studies in the genus *sesamum*.
4. Cytogenetical studies in *Brassicae*.

#### *Physiology*

1. The influence of sowing date on the differentiation and development of the inflorescence in an early and late variety of wheat.
2. The relation of rate of uptake of nutrients to different growth stages of wheat.
3. Drought resistance in wheat.
4. Plant Hormones.
5. Physiological analysis of factors influencing yield.

#### **Research Work being done at Sugarcane Station Coimbatore during 1948**

I. *Sugarcane Breeding*. comprising (a) crosses to evolve economic types, (b) Experimental crosses for evaluation of parents, (c) Sorghu crosses, (d) Bamboo crosses, (e) Fodder crosses,



(f) Crosses for evolving chewing canes, (g) Seed germination studies, (h) Pith investigations, (i) Morphological and anatomical studies, (j) The study of drought, frost and salt resistance in sugarcane, (k) Root studies, (l) and pests and diseases studies.

II. *Cytogenetical studies.* including work on (a) Cytogenetical studies on sugarcane and its intervarietal, interspecific and intergeneric hybrids, (b) Chromosome studies in *Saccharum* and allied genera, (c) Fundamental studies regarding the origin of *Saccharum* species and (d) Studies on sterility and parthenogenesis in sugarcane.

III. *Chemical studies.* involving (a) study of chemical composition of the juices of the important cane varieties in cultivation in India in relation to manufacturing qualities, (b) Growth and chemical composition of varieties in wet land, garden land other soil types.

IV. *Physiology of flowering in sugarcane.* involving (a) Effect of different photoperiods, manurial, irrigation and chemical treatments for (1) inducing flowering in non-flowering sugarcane varieties, (2) controlling the times of flowering in late and early flowering varieties and (b) studies in the chemical composition of flowering and non-flowering sugarcane varieties.

V. Exploration and collection of *Saccharum Spontaneum* and allied genera.

IV. Studies to ascertain whether there is any deterioration in cane varieties.

### **Soil Science and Agricultural Chemistry**

1. Soil Survey classification and mapping of soil.
2. Fundamental studies on soil profiles.
3. Soil colloids.
4. Comparative methods of determining mineral deficiencies in soil.
5. Lysimeter studies.
6. Phosphorus fixation studies.
7. To study to what level berseem treated with phosphatic fertilizers and followed by guar for 3 years builds up soil fertility as judged by their residual effect on subsequent yields of wheat and maize.



8. To study the effect of heavy doses of complete fertilizers (N. P and K) without legumes in building up soil fertility and maintaining crop yields of wheat and maize.
9. To study the effect of manuring and introducing a legume in rotation on soil fertility as judged by the effect on the yields of wheat and maize.
10. Effect of organic manures and artificial fertilizers, applied alone and in combination on the yields of wheat and maize.
11. Study of the chemical composition of the wild legumes of India.
12. Study of the methods of separate conservation of human and cattle urine and its utilization as manure.
13. Appropriation of atmospheric nitrogen through cultivated leguminous crops, wild legumes and root nodule organisms.
14. Nitrification of different organic and inorganic nitrogenous substances under different temperature and moisture conditions in different soils.
15. Utilisation of indigenous phosphates through legumes and bacteria.
16. Manufacture of Gur and Sugar from palmyra palm juice with special reference to control of fermentation of palm juice.
17. Studies on diseases of gram.
18. Studies on the Citrus malnutrition with reference to micronutrient element.
19. Studies on soil manganese.
20. Exchangeability and fixations of the cations of trace elements by the clay minerals in rotation to their availability to plants.
21. Studies on indicator plants with Bran, Zinc manganese and copper.
22. Effect of Coloured mulches on plant growth.
23. Studies on Soil colour.

### **Agricultural Engineering**

- (a) Possibilities and advantages in filling pneumatic tyres on country carts with water in lieu of air.
- (b) The design of an efficient and economically priced bullock gear.
- (c) The usage of small tractors under Indian conditions.
- (d) The economics of Tractor operation under Indian conditions.

- (e) The utilization of rotted material from town refuse dumps as compost.
- (f) Pumps and irrigation methods and problems etc. etc.

### *Mycology*

1. Physiologic specialisation in fungi.
2. Studies in antibiosis, microbial antagonism, bacteriostatic and fungistatic substances. Studies on fungicides.
3. Pathological investigations of crop plants and vegetable diseases with a view to evolve control measures.
4. Physiology of parasitism, disease resistance. Testing of varieties of crops plants for resistance to diseases. Assessment of losses due to plant diseases etc.
5. Virus diseases of plants.
6. Taxonomy of fungi. Maintenance of herbarium and culture collection.

### *Entomology*

1. *Research Problem.* Behaviour of *Musca* sp. towards light.  
*Review:*—A review of the ecological work done on *Musca* sp. in the world.
2. *Research Problem:*—The relation of specific susceptibility to amounts of HCN recovered after fumigation from different species of insects.  
*Review:*—A review of fumigation with H.CN acid gas in the world.
3. *Research Problem:*—Relation of metabolic activities of the insect pests of stored grains to their susceptibility to some fumigants.  
*Review:*—A review of work done on the fumigation of the insect pests of stored grains in the world.
4. *Research Problem:*—Factors governing the host-selection of *B. gelechiae*, a parasite of potato tuber moth.  
*Review:*—A review of work done on the significance of host selection in biological control.
5. *Research Problem:*—Chaetotaxical studies of immature stages of *Plusia* spp.  
*Review:*—A review of Chaetotaxical work on Lepidoptera of the world.



6. *Research Problem:—*

- (a) Development and standardization of technique and population study.
- (b) Study of fluctuation of population of spotted bollworms in relation to biotic and climatic factors.

7. *Insect Toxicology:—*

- (a) Establishment of Insecticidal Testing Laboratory.

- (i) Standardization of Bioassay techniques
- (ii) Standardization of Microdeterminatam techniques.

- (b) Establishment of mass rearing insectary for test insects.

8. *Biological control of pests of sugarcane:—*

- (i) Field survey of sugarcane pests and natural enemies
- (ii) Mass breeding and biology of *T. evanescens minutum*, *B. gelechiae*, *S. deesae* and *T. Beneficiens*
- (iii) Field experiments on the biological control of sugarcane pests.
- (iv) Experiments in storage godowns to control potato tuber moths by liberation of the exotic braconid parasite *M. gelechiae*.
- (v) On the nutrition, longevity and rate of reproduction in *T. evanescens minutum* Riley.
- (b) On the biology, bionomics and control of *A. tumidicossalis* H.

- 9. *Pests of stored food stuffs :-* (i) The biology and control of some of the serious pests of stored cereals and pulses in India.

- 10. *Discovery and control of insect vectors of the virus diseases of Indian crops.* (i) Survey of the white-fly and other insect vectors of virus diseases of economic crops like potato, papaya, castor etc. (ii) Field-scale trials on the control of tobacco leaf-curl disease (in cooperation with some Provincial Entomologists and the Central Tobacco Research Committee.

- 11. *Termites and their control.* (i) Systematic and biological studies and control work of termites common in Delhi and Karnal.

- 12. *Insecticides and fumigants.* Trials of important insecticides like DDT and 666, fumigants and work on insecticides made from indigenous plants and materials like tobacco and waste products in opium manufacture.

13. *Control of Houseflies.* Field scale trials of various methods.
14. Studies of immature stages of Indian insects and their mode of damaging crops.
15. General biology of promising pre-dators and parasites of insect pests.
16. Standardization of technique of fumigation of imported fruits against codling moths.
17. Investigations on the effect of different intensities of light on the reproductive power of sucking insects and on the degree of susceptibility or resistance of different varieties of tobacco to their attack.
18. *Taxonomic studies of insect groups of economic importance :-*  
Studies on Indian Parasitic Hymenoptera, particularly Ichneumonidae, Diptera of Agricultural importance (Agromyzidae, Typetidae and Tachinidae, Rhynchota particularly Aphididae and Isoptera).
19. Morphological and Biological studies on Phytophagous chalcids.

## INDIAN DAIRY RESEARCH INSTITUTE

### BANGALORE

#### DAIRY BACTERIOLOGY SECTION

1. Studies on under microflora in Indian cows.
2. Effect of abnormal milk on starter growth.
3. Use of china-blue. yeastrel-milk-agar for the enumeration of bacteria in milk.
4. Effect of cold storage on the bacteriological quality of milk.
5. Studies on the keeping quality of reconstituted milk.
6. Microflora of Indian Butters.
7. Bacterial flora in raw and heated milks.
8. Effect of common chemical and biological bactericidal substances on the growth and activity of milk organisms.
9. Biochemical studies on India *Dahi*. (Indian Council of Agricultural Research Scheme),
10. Survey of Bacteriological quality of Market Milk in India (Indian Council of Agricultural Research Scheme).



## DAIRY CHEMISTRY SECTION.

1. Studies of enzymes in milk with special reference to phosphates.
2. Study of the composition of indigenous dairy products-*Khoa*.
3. Amino acid make up of the different proteins of milk of different species of animals.
4. Rennet coagulation of milk.
5. The percentage of insoluble matter in milk.
6. Effect of butter fat, ground-nut oil and vanaspatis (m.p. 370 and 41% C) supplement to the typical poor South Indian Rice diet and effect of milk supplement on the same diet.
7. Growth promoting value of fractions of cows and buffalo ghee obtained by cold crystallisation from acetone.
8. Nutritive value of fresh, and acid high acid and bazaar ghee.
9. Investigation on the possibility of using thyroxine for increasing the milk yield of Indian cattle.
10. Preservation of milk by chemical treatment.
11. Chemical changes in milk constituents during souring.
12. Ultra-violet irradiation of milk.
13. Effect of Intravenous injections of nicotinic acid on the milk yield of Sindhi cows.
14. Effect of various heat treatments on the nutritive value of milk.
15. Composition of milk of cows, buffaloes, goats and sheep (Indian Council of Agricultural Research).

## DAIRY TECHNOLOGY SECTION

1. Keeping quality of market milk in relation to different treatments.
2. Investigations on the physio-chemical properties of raw milk, skimmed milk, butter milk and whey with special reference to their industrial evaporation, drying and desiccation.
3. Standardisation of the method of preparation of-Chhana.
4. Standardisation of the method preparation of "Khoa".

5. Time temperature relationship for the clarification of butter into ghee.
6. Alkali treatment of separated milk to remove fat, and the effect of such treatment on the preparation of rennet casein.
7. Investigations on the manufacture of desiccated Khoa powder from skimmed milk.
8. Transport of milk over long distances (Indian Council of Agricultural Research Scheme.)

### DAIRY HUSBANDRY

1. Raising calves on limited whole milk supplemented by artificial foods.
2. Efficiency of utilisation of feeds for milk production by cows and buffaloes.
3. Comparative efficiency of hand milking *Versus* machine milking.
4. Digestibility co-efficient of (a) crushed and (b) crushed and steamed Kulthi (*Dolichos biflorus*).
5. Digestibility co-efficient of gram husk.

### INDIAN INSTITUTE OF PHILOSOPHY,

#### *Amalner*

1. Reality of change.
2. Nature of Truth.
3. Time.
4. The Concept of Consciousness.
5. Sri Sankara's Philosophy.
6. The Absolute in Vedanta and in European Philosophy.

### THE INDIAN INSTITUTE OF SCIENCE, BANGALORE

1946-47

#### *Physics*

1. A Home-made Infra-red Spectrometer.
2. The Diamond and Its Teachings.
3. Raman Effect in Rock Salt.
4. Haidinger's Rings in Divergent Light.
5. New Concepts of Crystal Structure.



6. Magneto-optic Anomaly in Some Optical Glasses.
7. Raman Spectrum of Diamond under High Resolution.
8. New paths in Crystal Physics.
9. Raman Spectrum of Rock-salt under High Resolution.
10. Magnetic Properties of Iron-Pyrites.
11. Photo-elastic Constants of Diamond.
12. The Scattering of Light by Quartz.
13. The Dispersion, Birefringence and the Optical Activity of Quartz.
14. Thermo-Optic Behaviour of Solids : I. Diamond.
15. Thermo-Optic Behaviour of Solids : II. Fused Quartz.
16. Thermo-Optic Behaviour of Solids : III. Fluorspar.
17. Thermo-Optic Behaviour of Solids : IV. Zinc Blende.
18. Temperature Variation of the Refractive Indices of Quartz.
19. Faraday Effect in Some Cubic Crystals.
20. Thermal Scattering of Light by Diamond.
21. Thermo-Optic Behaviour of Solids : V. Alkali Halides.
22. Thermo-Optic Behaviour of Solids : VI. Optical Glasses.

#### *General Chemistry*

1. Electrolytic Reactions on Porous Carbon Anodes. Part I.—The Preparation of p-Benzoquinone by the Oxidation of Benzene.
2. Electrolytic Reactions on Porous Carbon Anodes. Part II.—The Preparation of Chlorobenzene from Benzene.
3. Electrolytic Reactions on Porous Carbon Anodes. Part III.—The Preparation of Ethylene-Chlorhydrin and Ethylene Glycol from Ethylene.
4. Electrolytic Reactions on Porous Carbon Anodes. Part IV.—Preparation of Chloral from Alcohol.
5. Conductance of Salts in Diethanolamine as a Non-Aqueous Solvent.
6. Endopolyploidy in Yeasts.
7. Physico-chemical studies of complex formation between molybdic and tartaric acids. Part II.—Studies on the optical rotation properties of molybdo-tartaric acid complex in presence of different bases, acids and alcohols.
8. Physico-chemical studies of complex formation between molybdic and tartaric acids. Part III.—Ultramicroscopic studies on the change of particle number and cataphoretic velocity of the molybdic acid sol particles during complex formation.



9. Physico-chemical study of Phthalocyanine and some of its metallic derivatives.
10. Rubber-lined Equipment for Chemical Industries. Part I.
11. Rubber-lined Equipment for Chemical Industries. Part II.—Electro-deposition of Rubber.
12. Rubber-lined Equipment for Chemical Industries. Part III.—Acid-Resistant Lining for Metallic Equipment.
13. Adsorption of Hydrogen and Carbon Monoxide and their mixtures on Fischer-Tropsch Catalysts. Part I.
14. Adsorption of Hydrogen and Carbon Monoxide on Fischer-Tropsch Catalysts. Part II.
15. The Theory of the Fischer-Tropsch Synthesis.
16. Development of the Fischer-Tropsch Process in Germany during the War.
17. Niobotartaric Acid, by N. R. Srinivasan (*Curr. Sci.*, 1947, 16, 60).
18. Chemical Engineering Education.
19. A Monograph on "Indian Graphite—Its Beneficiation and Probable Uses."
20. Induction of Polyploidy and Heterochromatin.
21. Catalytic Dehydrogenation of Ethylbenzene.
22. Manufacture of potassium chlorate.
23. Manufacture of Barium Chloride.
24. Centrosomes in yeasts.
25. Vitamin Requirements of some Lactic Micro-organisms.
26. Type-cultures for the micro-biological assay of amino acids.
27. Influence of the form of nitrogen on the quality and quantity of "Pitch" in Distillery practice.
28. Cultural conditions influencing the ergosterol content of yeasts.
29. Extract of Brood-lac as a supplemental nutrient for the production of antibiotics.
30. Influence of Carcinogens on yeast.
31. Nutritional requirements of a *Saccharomyces* sp. ? Isolated from Coconut Toddy,
32. Microbiological Assay of Niacin with a *Saccharomyces* sp. ? Isolated from Coconut Toddy.

#### *Organic Chemistry Section*

1. Studies in Sulphanilamides. Part III. N<sup>1</sup> and N<sup>4</sup>-substituted



1. sulphanilamides, Schiff's bases of sulphapyridine and sulphathiazole,
2. Studies in Sulphanilamides. Part IV.  $N^1$  and  $N^4$ -substituted sulphanilamides, acyclic, acyl derivatives of sulphathiazole and sulphapyridine.
3. Studies in Sulphanilamides. Part V.  $N^1$ - and  $N^4$ -substituted sulphanilamides.  $N^4$ -Isocyclicacyl derivatives of sulphathiazole and sulphapyridine.
4. Studies in Sulphanilamides. Part VI.  $N^1$ - and  $N^4$ -substituted sulphanilamides.  $N^4$ -sulphonyl derivatives of sulphapyridine and sulphathiazole.
5. Studies in Sulphanilamides. Part VII.  $N^1$ - and  $N^4$ -substituted sulphanilamides. Azo-dyes derived from sulphathiazole and sulphapyridine.
6. Studies in Sulphanilamides. Part VIII. *p*-Acetsulphanilamide derivatives substituted in  $N^1$ -position by mono and di-substituted thiurets.
7. Studies in Sulphanilamides. Part IX.  $N^1$ -sulphanilamide derivatives of phenyl dialkylthiol pseudodithiobiurets.
8. Essential oil from *Eucalyptus Globulus*.
9. Synthesis of new antimalarial drugs related to Atebrin, Part I.
10. Synthesis of new antimalarial drugs related to Atebrin. Part II.
11. Studies in Antimalarials. Part III.—Preparation of Paludrine.
12. A new method of synthesising phenacetin and allied compounds.
13. Aliphatic acyls of ethylene-bis- $N^4$ sulphanilamide.
14. Some azo-dyes of ethylene-bis- $N^1$ -sulphanilamide.
15. Some anils and diacyls of ethylene-bis- $N^1$ -sulphanilamide and some  $N^4$ -sulphanilamido-aliphatic esters.
16. A note on Preparation of Quinoline.
17. Studies in Sulphones. Part III. Synthesis of new contact insecticides.
18. Studies in Sulphones. Part IV. Some substituted alkyl-aryl and di-aryl sulphones.

#### Biochemistry

1. Heat treatment and biological value of soya-bean protein.
2. Studies on the nutritive value of soya milk. Part I to IV.
3. The fatty acids and glyceride structures of buffalo milk and



- depot fat and some characteristics of eastern animal fats.
4. Fluorescence in ghee and detection of its adulteration.
  5. The fatty acid components of Indian buffalo ghees.
  6. Studies on the methods of preparation of ghee. Par I to IV.
  7. Studies on the refractive index of milk.—Part I.
  8. Rancidity in Butterfat.
  9. Oilseed cakes as supplements to South Indian Rice diet.
  10. Oilseeds and seed-cake as articles of humanfood—groundnut cake hydrolysate as a substitute for yeast extract.
  11. Predigested protein foods.
  12. Digestibility of soya milk.
  13. Nutritive value of groundnut milk.
  14. Effect of supplements on the biological value of the protein in groundnut milk.
  15. Investigations on soya-bean milk and related products-pilot plant production of milk and human feeding experiments.
  16. A practical approach to the milk problem in India.
  17. Nutritive value of soya-bean and related products.
  18. Refractive index of milk.
  19. The effect of processing and souring milk by the indigenous method.
  20. Refractive index and refractive constant of milk low in solids-not-fat.
  21. Observations in Cryolysis in solution.
  22. Some factors affecting the refractive index and constant of milk.
  23. Inter-relationship between and variations of the analytical constants of milk.
  24. Effect of storage and acidity on the protection of vitamin A in shark liver oil.
  25. A note on the processing of maize to improve its value as an article of human food.
  26. Application of scientific processing to increase the nutritive value of coarse food materials.
  27. Production of more food from soil-possibilities of applying some recent scientific work.
  28. Growing of fodder crops on sewage.
  29. Milk from vegetable sources.



30. The effect of processing and souring milk by the indigenous method.
31. Rice gruel in food preparation—school feeding experiments with kanji (gruel) pudding at Bangalore.
32. Some lines of scientific approach to the problem of food shortage in India.
33. Some practical methods of food conservation or otherwise augmenting our food supply.
34. Reclamation of spoilt food.
35. A chromatographic absorption method for the determination of the provitamin A content of foodstuffs.
36. Synergic action of penicillin and bacteriostatic dyes.
37. Synergism in chemotherapy.—Part I.
38. Pterigospemin, the antibacterial principle of *Moringa pterigosperma*.
39. Investigation on plant antibiotics.—Parts I, and II.
40. Relationship between Nitrogen source and antibiotic products of *A. fumigatus fresenius*.
41. Symbiotic aspects of nitrification,
42. A shortened procedure for estimating vitamin B<sub>1</sub> in foodstuffs.
43. The Inhibitors of enzymatic and cupric ion oxidation of vitamin.
44. A micro method for the detection of phosphatases by 'Agar-plate' method.
45. Blood clotting factor in castor seed (*Ricinus communis*).
46. Effect of carbon dioxide and ultra-filtration on plasma prothrombin.
47. Thiaminase system in fresh-water mussel (*Lamellidens marginalis*).
48. The role of inhibitors in soya-bean.
49. Loss of nitrogen from sewage.
50. Influence of yeasts on protozoal activity in sewage.
51. Incrustation in water pipes as affected by filamentous iron bacteria.
52. The fertilising value of a solid product prepared out of cane molasses.
53. The cycle of life processes in sewage disposal.
54. Effect of different gases in protozoal activity and purification

of sewage.

55. Adulteration of broken rice and flour with silicious matter.
56. Reclamation of insect infested grains and flour.

## ELECTRICAL TECHNOLOGY

1. "Electronic Reverberation Recorder".
2. "A constant voltage to constant current Resonant converter".

## AERONAUTICAL ENGINEERING

"Measurement of Turbulence and Pitch of the Airstream in the 5'×7' Tunnel of Indian Institute of Science,"

## INTERNAL COMBUSTION ENGINEERING

Contributions have been made to written discussions of Institution of Mechanical Engineers papers. Apparatus for demonstrating the vibration of blades has been constructed and preliminary investigations have been made on a few research items.

**1947-48**

### *Physics*

1. The Raman Spectrum of Alumina and the Luminescence and Absorption Spectra of Ruby.
2. Second Order Raman Spectra of Crystals.
3. Vibration Spectra of Alkali Halides.
4. Birefringence of Crystals and its Temperature Variations: Part I. Calcite and Aragonite.
5. Scattering of Polarised Light Beams in Birefringent Solids.
6. Birefringence of Crystals and its Temperature Variation : Part II. Sodium and Potassium Nitrates.
7. Raman Spectra of methyl Alcohol, Ethyl Alcohol and *n*-Heptane.
8. The Vibration Spectra of Crystals : Part I. to VI.
9. The Scattering of Light in Diamond and its Raman Spectrum.
10. The Raman Spectrum of Rock-Salt and its Interpretation.
11. Raman Spectrum of Ammonium Chloride and its Variation with Temperature.
12. Raman Spectrum of Alumina and the Luminescence of Ruby.
13. The Raman Effect in Topaz and its Relation to Luminescence Spectrum.



14. The Infra-red Absorption Spectrum of Diamond and its Variations.
15. The Emission and Absorption Spectra of Luminescent Diamonds.
16. Dynamical Theory of the Vibration Spectra of Crystals : Parts I. to IV.
17. Influence of Temperature on the Raman Spectra of Crystals : Parts I & II.
18. The Dispersion Formulae of the Alkali Halides.
19. Directional Variations of Photoconductivity in Diamond.
20. The Infra-Red Spectrum.
21. The Eigenvibrations of Crystal Structure.
22. Dynamic X-Ray Reflections in Crystals.
23. Beta-Ray Counters.
24. Infra-Red Absorption Spectra of Crystals.
25. The Raman Spectra of Water, Heavy Water and Ice.
26. Fluorescence and Phosphorescence of Diamond at different Temperatures.
27. Raman Spectrum of Ammonium Bromide and its Variation with Temperature.
28. The Raman Spectra of Cyclohexane, Glycol and Glycerine.
29. Temperature variators of the Refractive Index of Quartz.

#### *General Chemistry*

1. The Surface Chemistry of Rubber Latex—Parts I. & II.
2. The Chromite and Associated Rocks of Kondapalle.
3. Effect of Wetting Agents on the Electrophoretic Mobility of Rubber Particles.
4. An Accurate Pressure Gauge employing Measurement of Surface Strain on Diaphragms.
5. Rate of Reduction of Sulphate by Vibrionesulphuricans.
6. Studies in Industrial Enzymes—Parts IV. & V
7. Extract of Broodlac in the Production of Antibiotics.
8. Nutritional Requirements of Toddy Yeast.
9. Niacin Assay.
10. Effect of Biotin on the Nitrogen Content of Yeast.
11. Microbiological Formation of Elemental sulphur in Coastal Areas.
12. Effect of Carcinogens on Yeasts.



13. Agricultural and Industrial Wastes as fortifying supplements for Industrial Fermentations.
14. A New Strain of Yeast for the Production of High Concentration Washes in Distillery Practice.
15. Chromosome Constitution and Characteristics of Giant Colonies in Yeasts.
16. Centrosomes in Yeast.
17. Endopolyploidy in Yeasts.
18. Is the Macronucleus of Ciliate Endopolyploid?
19. Studies on the Cytology of Yeasts—II. Induction of Polyploidy and Heterochromatin.
20. Induction of Mutation in Yeasts by Low Temperatures.
21. Chromosomal Changes and Nutritional Requirements of Yeasts.
22. Rate of Growth of Diploid and Tetraploid Yeasts.
23. Auto-tetraploidy and Attenuating Power in Yeasts.
24. A Reverse Mutation induced by Ultra-Violet Irradiation.
25. Niobotartrates.
26. Nickel-Thoria-Kieselguhr (100:18:100) Catalyst for Fischer-Tropsch Reaction Parts I. to III
27. Photochemical Studies in Sols and Gels.—Parts I & II
28. Conductance of Salts in Non-Aqueous Solvents—Parts I & II
29. Thermodynamic Functions of Oxygen at Temperature upto  $200^{\circ}\text{C}$ . and Pressures upto 1000 Atmospheres.
30. Volume-entropy Diagrams of Carbon Dioxide at Temperatures upto  $150^{\circ}\text{C}$ . and Pressures upto 3000 Atmospheres.

#### *Organic Chemistry*

1. Studies in Sulphanilamides, Parts X to XIV.
2. Recent Advances in the Chemistry of Sulphanilamides 1941-47.
3. Studies in Antimalarials, Parts IV & V.
4. Recent Advances in the Chemistry of Antimalarials.
5. Sulphanilamides as Antimalarials.
6. Studies in Sulphone Drugs, Parts I to IV.
7. Organo-arsenicels, Parts I to III.
8. Studies in Sesquiterpenes, Parts I & II.
9. Constitution of  $\alpha$ -Clausenane.
10. Studies in Santalol Series, Parts VIII to XIV.
11. Studies in Antimalarials : Some sulphabiguanide derivatives.



12. Ammonolysis of aliphatic ketones with hydrogenation.
13. Some benzene 1 : 4-disulphonic acid esters.
14. Some benzene 1 : 4-disulphonamides.
15. Studies in Antimalarials : Sulphabiguanide derivatives.
16. Some N<sup>1</sup>-(8-quinolyl)-N<sup>5</sup>-phenylbiguanides.
17. Organo-arsenicals: Aryl sulphonyl esters of hydroxyphenyl arsonic acid.
18. Studies in Antimalarials : Sulphabiguanide derivatives.
19. Studies in antimalarials : Biguanido-aryl-arsenicals,
20. Role of Different Branches of Science, in Pharmaceutics.

### CHEMICAL ENGINEERING

1. Performance of Liquid—Liquid extraction column.  
Part I : Spray Columns
2. Part II : Packed Column
3. Performance of Liquid—Liquid extraction Column  
Part III : Air Agitated Column,
4. Flooding and Pressure drop in Packed Columns for Liquid—  
Liquid Extraction,

### Biochemistry

1. Synergistic action of l-cystine on vitamin C utilisation *in vivo*.
2. Detection of adulteration of ghee.
3. Refractive dispersion of ghee.
4. Use of Anti-oxidants and rancidity in vegetable oil, shark liver oil and ghee.
5. A possible mode of action on Penicillin.
6. The role of science in food planning for India.
7. Investigations on plant antibiotics, Part II.
8. Thiaminase system in fresh mussel.
9. Further studies on the mechanism of B-amylase inhibition by vitamin 'C'.
10. The Vanaspati problem.
11. State policy and Vanaspati Industry.
12. Vitamin A protection in shark liver oil during normal storage;  
Some factors affecting the protective power of antioxidants.
13. The effect of ultrafiltration and carbon dioxide on the  
prothrombin activity of plasma.



14. A practical approach to the Food Problem in India.
15. Studies on Streptomycin — Part I. Certain aspects of antibiotic Production by *Actinomyces Griseus*.
16. Contribution of the major constituents of milk to the Refractive Index.
17. Blood clotting factor in castor seed (*Ricinus communis*).
18. A note on the processing of maize to improve its value as an article of human food.
- 19-22. Method of preparation of ghee—Parts V to VIII.
23. Significance of proteolytic inhibitor in the low nutritive value of leguminous proteins.
24. Supplementary effect of different varieties of soya-bean to poor rice diet.
25. On the occurrence of protozoa in land filtered sewage effluent,
26. A note on tamarind pectin,
27. Studies in Bacterial Amylases—Part I. Effect of different forms of nitrogen on the formation of an amylase in bacteria.
28. The toxicity of the Burma bean.
29. Effect of alkaline water on the quality of raw silk.
30. The cystine and methionine contents of common Indian foods.
31. Biological evaluation of soya bean milk proteins by the regeneration of liver protein in the rat.
32. Influence of variety, manuring and germination on Vitamin B<sub>1</sub> content of groundnut (*Arachis hypogea*).
33. The proteolytic enzyme of the latex of *Ficus carica* Linn.
34. The incidence and elimination of hydrocyanic acid from Burma beans (*Phaseolus lunatus* L.)
35. Relative efficiency of bacteria and protozoa in the flocculation and oxidation of organic matter suspended in water.
36. On the preparation of pure cultures of (*Vorticella*).
37. Respiration of (*Vorticella*).
38. Utilisation of sewage farms for growing sugarcane and production of white sugar.
39. Protein value of soya-bean milk—human feeding experiments.
40. Utilisation of soya-bean milk protein for the formation of blood protein.
41. The mechanism of the stabilisation of the milk clotting activity of Fig latex.



42. On the significance of the Gram-test for bacteria in relation to pencillin bacteriostasis.
43. The Problem of the Burma bean.
44. Effect of antibiotics on the milk clotting enzymes of *Casica papaya* and *Ficus carica*.
45. Regeneration of prothrombin activity, by carbon dioxide.
46. Influence of the extracts of germinated Indian pulses on the formation of amylase by *Bacillus subtilis*.
47. Possible utilisation of desizing washings for the culture of industrially important micro-organisms.
48. Effect of supplementation with tamarind and chillies on the growth of young rats on a poor South Indian rice diet.
49. Foods and Food Supplements—Need for co-operative effort in planning for self-sufficiency.
50. Observations on nitrite producing bacteria from different sources and the role of protozoa in nitrification.
51. The Refractive Constant of whole and skimmed milk.
52. Factors affecting the nutritive value of soya-bean milk protein.
53. Influence of heat on the physico-chemical properties of gum-arabic.
54. Influence of Vitamin C and oxidising agents on prothrombin.
55. Vitamin C content of lucerne and the factors controlling its stability.
56. Role of protozoa in the concentration of nitrogen in the sludge during aerobic purification of sewage.
57. Studies in bacterial amylases—Part II. The source of carbon as a determinant in amylases formation.
58. Studies on vegetable rennet—Part I Milk clotting enzyme of *Ficus carica*
59. Examination of Indian shark liver oils.
60. Measurements of oxygen absorption in Shark liver oil.
61. Effect of some factors on the vitamin content of shark liver oil.
62. Studies on the preparation of ascorbic acid from the Indian gooseberry (*Phyllanthus emblica*).
63. Fortification of soya milk with calcium and study of its availability to growing rats.
64. Relative utilisation of calcium from soya milk (fortified with calcium phosphate) and cow's milk by growing children.

65. Studies on the nutritive value of groundnut milk.
66. Vegetable dyes as antioxidants for vegetable oils.
67. Studies on Vitamin C in soya-bean and milk.
68. *In vitro* Digestibility of Groundnut milk.
69. *In vitro* Digestibility of soya milk and tryptic inhibitor.
70. Vitamin A destruction in shark liver oil (*Zygæna Blochi*) and the effect of adding antioxidants.
71. Storage of ghee.
72. Disposal of tannery wastes.

## **POWER ENGINEERING AND ELECTRICAL TECHNOLOGY.**

### **List of Papers relating to Research and Development Published in 1947-48**

1. Suggested Improvements in the Performance Calculations and Design of Auxiliary Circuits of Single Phase Induction Motors.
2. Three Phase Motors on Single Phase Supply.
3. D. C. Transmission.
4. Paper Machine Drive.
5. A. C. Network Analyzers.

## **ELECTRICAL COMMUNICATION ENGINEERING**

1. Development, Design and Construction of Equipment for Electroacoustic Research.
2. Reverber-O-Graph.
3. Application of Tube 833 A as Ultra High Frequency Oscillator.
4. Logarithmic Amplifiers.
5. Construction of an ABAC for the solution of the R-L or the R-C Circuit.
6. Dielectric contents of some solid insulating materials at Ultra High Frequencies.

## **INDIAN SCHOOL OF MINES AND APPLIED GEOLOGY DHANBAD.**

Petrology of the igneous intrusions of the Dhanbad and Jharia  
coalfield areas.



**VISVA-BHARATI  
SANTINIKETAN  
WEST BENGAL  
VIDYA-BHAVANA.**

1. History of commentary of the Quran.
2. Contributions of Bengal towards Islamic Studies and Culture.
3. SARMAD Editing Rubaiyat with translation.
4. Shahwali Allah, His works and his Philosophy (monograph)
5. Tippani on Mimamsa-Darsan.
6. Translation of the Nyayamala Mimamsa).
7. Bengali Mahabharat.
8. Yosovanta Das.
9. Editing of Abhidharama Kosa Bhasya.
10. Editing of Abhidharma Samuccya & Bhasya.
11. Gathas of Zarathustra.
12. Selected Chapters from the other Avesta.
13. Handarz texts in Pahlavi.
14. Old Gujarati Version of the Saddar.
15. Ravikankan Mukundarama's Candimangala.
16. Sunya Purana (Ramani Pandita).
17. Goraksa Vijaya (Bhimseni Raya).

**HINDI BHAVANA**

1. Natha-Sampradaya (History and Philosophy of Natha cult).
2. Kabirpanthi Sahitya (A critical survey of the literature of Kabir-sect).
3. Editing of a Ms. attributed to Chauranginatha-a. Natha-Siddha of the IX cc.
4. Hindi Literature-A Retrospect & prospect- (A concise history of Hindi literature with its social and cultural setting).
5. An extensive survey of the Apabhramsa literature.
6. Collection of mystical terms for the proposed dictionary.
7. Northern Saiva Literature.

**RABINDRA-BHAVANA.**

1. A Descriptive Catalogue of Tagore Manuscripts.
2. Tagore's Interpretation of Indian Civilisation.



3. Chhandoguru Rabindranath (Tagore, the Metre-artist).
4. Listing of Tagore's Writings according to topics.
5. Social Ideals of Rabindranath.
6. Prakritir Kavi Rabindranath (Tagore, the Nature-Poet)-already published.
7. Compilation of the Notations of Tagore Songs.
8. Indexing of Tagore's letters (Bengali & English).
9. Indexing of News paper Cuttings relating to Rabindranath & Visva-Bharati.
10. Lyrical Poetry of Rabindranath.

## CHEENA BHAVANA

### GROUP A

#### *Buddhist Sūtras*

1. *Bhavasankrantisutra* and Sastra with Maitreyanatha's comment, edited with English translation and Tibetan version, published in the Adyar Library Series.
2. *Nairatmyapariprccha* of Asvaghosh Restored from Tibetan.
3. *Comparative studies in the Mahaparinirvanasutta* and its Chinese version.
4. *The first Chinese Buddhist scripture The Forty-two-Chapter Sūtras.* A Chinese Text taught by Prof. Tan Yun-Shan; rendered in to Sanskrit by Sujit K. Mukherjea, into Pali by Rev. Sumangal; retranslated into English with a critical introduction.
5. *Arthapadasutra* A critical study of the Chinese version of the text comparing its corresponding Pali version.
6. *Salistambasutra* A restoration from its Tibetan and Chinese versions, on the theory of Buddhist causation.

### GROUP B

#### *Buddhist Philosophy*

1. *Trisvabhavanirdeśa* of Vasubandhu, a treatise on three natures of things, belonging to Yogacara School. Critically edited.
2. *Alambanapariksa* of Dinnaga with Dharmapala's comment. A logicophilocal treatise restored into Sanskrit with English translation and critical notes published.



3. *Vimuttimagga* A comparative study.
4. *Pratityasamutpadahrdaya* of Nagarjuna from Chinese on Bud. theory of causation, translated into English.
5. *Tattvasiddhi Sastra* of Harivarman C. 300 A. D. A philosophical treatise probably of Sautrantika School. A critical study with Sanskrit restoration from the Chinese version of Kumarajiva.
6. *Abhidharmamrta*, a philosophical treatise for Sarvastivadin—Sanskrit restoration from the Chinese version.
7. *Karatalaratna* of Bhavaviveka. A logico-philosophical treatise, critically studied with a Sanskrit restoration from Chinese.
8. *Dvadasanikaya* of Nagarjuna from the Chinese version—A critical study and Sanskrit restoration.

### GROUP

#### *Vinaya & Sadhana*

1. *Parajikas* of the *Dharmaguptaka vinaya* and *Pali Suttavibhanga* English translation from Chinese.
2. *A Comparative study of the Pratimoksa* on the basis of its Chinese, Tibetan, Sanskrit and Pali versions.
3. *Bodhicittotpadasutra* of Vasubandhu rendered into Sanskrit from the Chinese version.
4. *Bodhicaryavatara*, Sanskrit text in parallel with the Tibetan version.
5. *A Text on Dhyana* Restored from Chinese.

### GROUP D

#### *Linguistics and Lexicon*

1. *Sambhota's Tibetan Grammar* translated into Hindi.
2. *Tibetan Dhatukosa* 560 Roots arranged according to Ruavali with Hindi equivalents.
3. *Tibetan spelling Dictionary* with Sanskrit and Hindi equivalents.
4. *Tibetan Synonyms Dictionary* edited by the same Scholar.
5. *Indexes Vervorum* Chinese Sanskrit to *Suvarnasaptati*, *Salistamba-Sutra* and *Karatalaratna*.
6. *Chinese easy to learn* A text book for foreigners to learn the Chinese language, containing six parts :



- |                   |                 |                 |
|-------------------|-----------------|-----------------|
| I. Introduction ; | II. Phonetics ; | III. Radicals ; |
| IV. Grammar ;     | V. Selections ; | VI. Vocabulary. |

## GROUP E

### Miscellaneous Works

1. *Vajrasuci* of Asvaghosa, the Sanskrit text on the Brahmanical Caste System, critically.
2. *Mahayana* (in Hindi).
3. *Some critical and Comparative notes on the Nyayapravesa* (in Chinese).
4. *India in Chinese Literature* An Exhaustive Collection of All Chinese Records on India, from the 1st Century to the 19th Century—Collected, Compiled and being translated into English.
5. *Introduction to Sinology* being prepared specially for Indian Scholars to study Chinese subjects such as *Classics, Philop, Religion, History, Literature, Arts* etc.
6. *Sardulkarnavadana* A critical edition of the Sanskrit text comparing with Tibetan and Chinese versions.
7. *Chines Tripitaka* A monograph,
8. *A Catalogue of Bud.-Sanskrit Mss.* deest in Chinese.
9. *Sautrantikas and their tenets* A monograph.
10. *History of Buddhism in South India.*

## GROUP F

### General Works

1. *Bodhicaryavatara* translated into Bengali and Hindi.
2. *Trimsikabhasya* of *Sthiramati* translated into Chinese with critical notes.
3. *Modern China* translated into Bengali and Hindi.
4. *Best stories of Tagore* translated in to Chinese.
5. *an min chu I* translated into Hindi.
6. *China's Destiny* by *Chiang Kai Shek* translated into Hindi.
7. *China's Desting* by *Chiang Kai Shek* translated into Bengali.



8. *Discovery of India* by Pandit Nehru, translated into Chinese.

*Agriculture.*

- (a) Varietal, Manurial & Cultural experiments on paddy.
- (b) Trial of Crops suitable for Birbhum soil.
- (c) Experiments on crop Rotation.
- (d) Experiments on fodder cultivation on waste lands.
- (e) Selection & Breeding of Cattle.

*Agriculture, Forestry & Botany.*

Soil Conservation Research :

- (a) Prevention and control of (i) Sheet Erosion & (ii) Gully Erosion.
- (b) Reclamation of Eroded Lands.
- (c) Evolving comparatively cheap methods & systems of plantation and cropping with the object of soil and moisture conservation.
- (d) Study of the local flora.

*Rural & Agricultural Economics.*

- (a) Rural Indebtedness in Birbhum, West Bengal.
- (b) Cost of Production & Size of Farm.
- (c) Agricultural Labour & Wages in Birbhum.
- (d) Comprehensive survey of rural & Agricultural economic conditions.
- (e) Researches on Land Tenure & Population in West Bengal.

*Education.*

Experiments on Rural Education-Siksha Satra.

---